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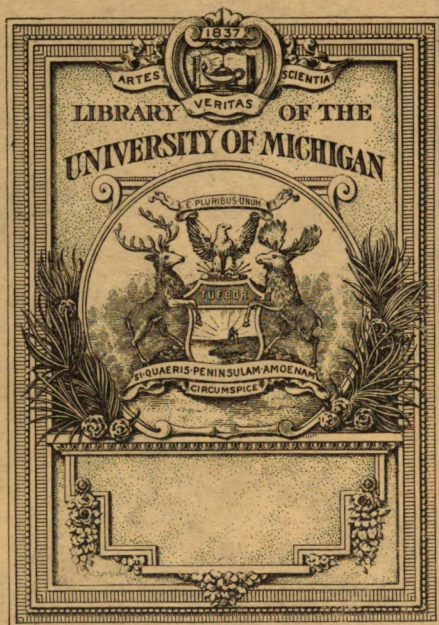
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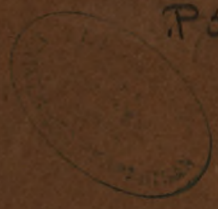


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PREFACE TO THE ELEVENTH VOLUME.

THE completion of the tenth volume of this Journal affords a suitable opportunity for considering whether any modification in its form and arrangement might be advantageously adopted. It has been suggested that it would be desirable to print each number on one large sheet, and to affix a stamp for transmission by post. This, however, would entail so radical a change in the form, and so much curtailment in the amount of matter, that it has been abandoned. Each number at present contains altogether three and a half (sometimes four) sheets besides the cover. A sheet that size would exceed the limits of the penny stamp, and even if this were not the case, the folding of a single sheet of paper, twice the size of the *Medical Gazette*, would be scarcely practicable. The form of the Journal is therefore continued as before, but the size of the page is enlarged, the margin being diminished in proportion, by which means the quantity of matter is increased by one-sixth.

No alteration is made in the arrangement of the contents and the general management. The Transactions of the Pharmaceutical Society form a distinct portion of the work, and are under the official superintendence of Mr. Redwood. The second page of the cover (behind the table of contents) is devoted exclusively to the official notices of the Society.

In the remainder of the work the Editor is as heretofore assisted by Dr. Pereira and Mr. Redwood, with whom a meeting takes place early in each month to decide upon the contents of the succeeding number. This arrangement secures to the Journal the most able and efficient contributions in the two departments of *Materia Medica* and scientific Chemistry. Other assistance on special subjects is obtained as occasion requires from the best available authorities.

The general responsibility rests with the Editor, more especially in reference to the leading articles, other articles to which no name is attached, and such matters as relate to the interests of the Chemists and Druggists as a body.

This Journal was commenced without any promises or pretensions, and is continued on the same principle. It was undertaken for the sole purpose of aiding the Pharmaceutical Society and promoting the objects for which that Society was founded, namely, the union of the Pharmaceutical Chemists of this country as a recognized body, and the advancement of the art and science of Pharmacy by the introduction of a regular system of education, and by other available means.

The subject matter of the work is not confined to Pharmacy in the restricted sense of the term, but comprises General Chemistry, Sanitary Questions, Medicopharmaceutical Legislation, and other matters likely to interest the Pharmaceutical Chemist, or with which he ought to be conversant.

It is in contemplation to publish a complete Index of the ten volumes. This, however, will depend upon the number of our readers who may be disposed to subscribe to it. Further particulars will be stated next month.

THE PRINCIPLE AND PROSPECTS OF THE PHARMACEUTICAL BILL.

THE circular issued last month to the Members of the Pharmaceutical Society by authority of the Council, contained a concise outline of the clauses of this Bill, which we subjoin, with the addition of a few explanatory remarks, suggested by the inquiries of correspondents :—

Clause I. confirms the charter of the Pharmaceutical Society, except such parts as are altered or repealed in this act.

Clause II. The council to appoint a registrar and other officers.

Clause III. The registrar to prepare, from time to time, a list of all Pharmaceutical Chemists, their assistants, apprentices, or students, respectively.

Clause IV. Registrar to keep books, &c.

Clause V. Certificate of register to be good evidence in the absence of the contrary.

Clause VI. All members and associates* of the Pharmaceutical Society to be registered, also every other person, within one year, on his producing evidence that he was exercising the business at the time of passing this act.

Clause VII. Assistants, apprentices, and students to be registered.

Clause VIII. The Board of Examiners of the Pharmaceutical Society recognized.

Clause IX. The council empowered to make and alter bye-laws, subject to the approval of one of her Majesty's principal Secretaries of State.

Clause X. Every person examined and having obtained a certificate to be registered.

Clause XI. Power to suspend or modify examination in the case of persons apprenticed before the date of the act.

Clause XII. After one year from the passing of the act it shall not be lawful for any person not duly registered to exercise the business, to assume or use the name of Pharmaceutical Chemist, &c., or any name, sign, token, or emblem implying that he is registered under this act, under a penalty not exceeding 20*l.* nor less than 2*l.* Penalties recoverable in the county courts, &c.

Clause XIII. No proceedings to be taken after the expiration of two months from the commission of the offence.

Clause XIV. Penalties to be forfeited to the Crown.

Clause XV. Registrar liable to penalty for the falsification of any register, &c.

Clause XVI. Penalty for procuring certificate of registry by fraudulent means.

Clause XVII. Act not to extend to or interfere with the rights, &c., of legally qualified medical practitioners.

Clause XVIII. Provided they do not take or use the name of Pharmaceutical Chemist, Chemist and Druggist, &c.

Clause XIX. Exemption in favour of druggalaters, vendors of patent medicines, horse and cattle medicines, or chemicals, &c., used for other than medicinal purposes, such parties not using any name, title, &c., implying that they are registered under this act.

While this Bill is, in principle, strictly in accordance with the purpose for which the Pharmaceutical Society was established, it is not retrospective in its operation. Existing Chemists having a vested interest in the business, are, by the sixth clause, entitled to be registered, and provision is made for the claims of those who are serving or who have served an apprenticeship. The relative positions of Members and non-Members are not affected by the Bill. All will be registered as Pharmaceutical Chemists, but the admission of future Members into the Society will be regulated as heretofore by the bye-laws, and the registration of future Chemists will be preceded by an examination.

The effect of this Bill, if it should pass into a law, will be, to introduce a gradual improvement in the standard of qualification, and thus to carry out to the full extent the work which the Society has commenced. No law of this description could by possibility bring about a sudden revolution, and whether such a law be passed this year or ten years hence, the same regard must be paid to existing interests, and the same time must be allowed for bringing to maturity the provisions of the Act; consequently, whatever delay may occur, will be

* The word *associates* was omitted by accident in the circular.

time lost, and the importance of a vigorous and united effort in supporting the Bill, must be obvious to all those who desire to see the Pharmaceutical Chemists of this country placed in their proper position, and recognized as an educated body.

The Bill does not in any way interfere with the interests or privileges of medical practitioners, who, by the 17th clause, are exempted from its operation. The 18th clause however provides that they shall not assume or use the name of Pharmaceutical Chemist, Chemist and Druggist, &c. Lest the effect of this latter clause should be misunderstood, we may observe, that it does not prohibit the exercise of those functions which are performed in common by the Apothecary and by the Chemist. That is to say, the medical practitioner may practise Pharmacy, dispense and sell medicines, exhibit in his window the emblems and insignia of a medico-pharmaceutical establishment, but, instead of assuming the titles which are in future to belong exclusively to persons registered under this act, he must appear before the public in his true character as a medical man. The titles Surgeon, Accoucheur, and Apothecary, imply a superior and more extended qualification than the title of Chemist and Druggist, consequently the assumption of the latter title instead of the former can scarcely be considered a privilege. If, however, any medical men, who may be keeping Chemists' shops at the time of the passing of this Act, should desire to identify themselves with that business, the Act is not retrospective in its operation, and they may be registered as members of the trade. We therefore think no reasonable ground of objection can be taken against this provision, but if such should be the case the question is open to reconsideration.

Two or three of our correspondents have intimated that the restrictions in the Bill are not, in their opinion, sufficiently stringent. This subject has been maturely considered in all its bearings, and we have good grounds for believing that the attempt to introduce greater stringency would provoke an amount of hostility which would be fatal to the passing of the Bill. We think the Bill in its present form would practically work well; it reserves the rights and privileges of those from whom opposition might otherwise have been expected, and the prospective advantages to be derived from it will be made manifest in the gradual improvement in the qualifications and standing of the Pharmaceutical body.

It has been suggested by several correspondents that an exemption from serving on juries and other similar offices would be a just and desirable provision, as Chemists who have no person to supply their places at home, are sometimes detained for days on juries to the great injury of themselves and danger to the public. This subject is under consideration. The provision was advisedly omitted under the conviction that it was policy to make the Bill as simple and free from debateable questions as possible. When the general principle of the Bill is admitted, the exemption from juries may be considered on its own merits among other details. It is also probable that some other amendments of a trifling nature may be found desirable on a further discussion of the clauses.

In the official circular before alluded to, some doubt was expressed as to the probability of the Bill being passed at this late period of the session. In the present state of the business of the House, the passing of any Bill of moderate urgency must be attended with uncertainty. This however, should not be a source of discouragement. Up to the present time, we have seen no reason to anticipate opposition. All the medical practitioners with whom we have communicated, are favourable to the Bill, and petitions from the profession are in course of signature. It is not a popular question, yet the public on hearing an explanation of the principle, at once acquiesce in the advantage of the measure. Only one opinion appears to prevail among Chemists, and petitions are steadily coming in. The pressure from without is the most effectual propulsive force for passing a Bill through the House, and if this should be energetically applied, we have every reason to hope for a favourable result.

THE ADULTERATION OF COFFEE AND CHICORY.

In our last volume (page 394) we gave some account of the prevalent adulterations of coffee and chicory. We revert to the subject in consequence of a discussion in the House of Commons, on the 5th of June, in which an extraordinary doctrine was propounded in reference to the practice of adulteration. It was argued that coffee mixed with chicory was better than coffee alone, and generally preferred by the public, *therefore* it was justifiable and proper for a grocer to sell the mixture indiscriminately when applied to for ground coffee!

Mr. Thomas Baring, who introduced the question with a view of exposing and checking the prevailing frauds, adverted to the several Acts of Parliament relating to the subject. The 41 and 42 Geo. III. inflict a heavy penalty on the vendor or possessor of any substitute for coffee. The 3rd of Geo. IV. permits the sale of such substitutes under their right names by persons not dealing in coffee. By the 7 and 8 Geo. IV. the exclusive power of prosecuting in such matters is vested in the Commissioners of Customs or Excise, who are subject to the orders of the Lords of the Treasury. In 1832 a Treasury minute was issued permitting the sale of chicory powder unmixed, but prohibiting its mixture with coffee.

In 1840 another Treasury minute was issued, in pursuance of which the Commissioners of Excise published the following order:—

“Ordered, that no objections be made on the part of the Revenue to dealers in and sellers of coffee mixing chicory with coffee, or to their having the same so mixed on their premises.”

From this date the adulteration of ground coffee has been progressively on the increase, and the adulteration of chicory has increased in the same ratio. The purchasers of ground coffee are therefore liable to receive a mixture of coffee, chicory, horse beans, potato flour, dog-biscuit, mahogany sawdust, tan, and other rubbish.

It was the object of Mr. Baring to obtain the rescinding of the Treasury Order which had sanctioned the primary adulteration, and thus given an indirect encouragement to a most extensive and disgraceful system of fraud. Mr. Baring and his supporters contended that no kind of fraud ought to be sanctioned by the Government; that if chicory be mixed with coffee, it should be sold as a mixture, and not under the name of ground coffee, that the public should have the option of purchasing either the pure or the mixed powder; that the competition obliged those who would otherwise act honestly to go with the stream, and that the habit of fraud in one case, was likely to extend to other branches of the trade, to the great injury of the public. On the other side, it was argued that coffee is as good as chicory, and a mixture of coffee and chicory is better than coffee alone; that the public sometimes buy more chicory, because the quantity mixed with the coffee is not sufficient; that those who desire pure coffee may grind it themselves; that the price of ground coffee is a sufficient indication of its purity or admixture with a cheaper ingredient, that the employment of an army of excise officers to inspect and inform against grocers who mix chicory with coffee, would be highly objectionable, and that the public should be left to take care of themselves. During the discussion it was asked whether the same privilege would be allowed for the adulteration of beer—a similar inquiry might have been made with regard to drugs. The result of the division was against Mr. Baring's motion by a majority of five.

There are two points of view in which this question ought to be considered: first, in reference to the revenue: secondly, as a question of fraud. So far as the revenue is concerned, it is the duty of the Chancellor of the Exchequer to protect the public treasury against loss; but it is not his especial duty to protect the public against fraud. It having been decided that “no objections be made on the part of the revenue” to the mixture of chicory with coffee, the jurisdiction of the Chancellor of the Exchequer is at an end. But by the 7th and 8th of Geo. IV., the power of prosecuting in cases of this kind

is vested exclusively in the Commissioners of Excise or Customs; consequently the public have no redress.

The proper remedy for the existing abuse appears to us to be the repeal of that portion of 7 & 8 Geo. IV., which relates to the prosecution of persons for the adulteration of coffee, and the addition of a proviso to the Treasury order of 1840 to the effect, that this order does not sanction the fraudulent admixture of other ingredients with coffee, such admixture being punishable by action or information before a magistrate in the same manner as other descriptions of fraud, the party defrauded being at liberty to take proceedings. This would exonerate the Government from connivance at fraudulent adulterations, relieve the Excise from the responsibility of prosecuting, and place the remedy in the hands of the public.

Mr. Baring gave notice of a motion "that it be an instruction to the Committee (on the Custom's Amendment Bill) to make provision for preventing the mixture of chicory with coffee by the vendors of coffee," which stood for consideration on the 23d of June, but was deferred.

We have alluded to this subject, not as an Excise question, but on account of the principle of fraudulent adulteration involved in it—a principle equally applicable to drugs and other articles of consumption.

THE SUPPLY OF WATER TO THE METROPOLIS.

THE water supply controversy has always been more or less a chemical question. This is especially the case at the present time, since each of the several parties actively engaged in it rely with confidence on the analysis of the water recommended, as the most conclusive argument in favour of the proposed plan.

In another part of this number will be found a very brief notice of three of the chemical reports recently published. The Government Water Bill, now under the consideration of a Committee of the House of Commons, proposes the amalgamation of all the Water Companies under the controul of the Secretary of State, who is to direct the new company to procure water from such sources as he may think proper, and to discontinue taking it from any existing sources which to him may appear objectionable. He is also to give general directions respecting filtration, purification, &c. The investigations of Professors Graham, Miller, and Hoffman have been undertaken for the purpose of assisting in the determination of this difficult question, and the report contains a very full account of the qualities of the waters from the various sources under consideration.

Mr. Mowatt has brought in a Bill for placing the water supply under a representative parochial Board. The Standing Orders Committee reported against this Bill, the Standing Orders not having been complied with. It was discussed at some length in the House on the 24th of June, and was by leave withdrawn.

The Watford Spring Water Company and the Wandle Water Company continue to struggle for existence, each appealing to the purity of their water as a ground for support.

The West Middlesex Water Company have recently had a chemical examination of their water by Dr. Alfred S. Taylor and Mr. Aikin, the tenor of which is favourable to the Thames water when taken from a locality not in the vicinity of the metropolitan sewerage. This water is, however, harder than some of the waters recommended. All the chemical reports, suggestions, plans, and speculations, are referred to the Committee of the House of Commons, which was appointed to consider the Government Bill and the entire question of the water supply. It is doubtful whether any Bill will be passed during the present session on account of the intricacy of the subject, and the determined opposition against every measure which has been proposed.

ORIGINAL AND EXTRACTED ARTICLES.

ON CYPRIAN LABDANUM.

BY DR. X. LANDREER,

Professor in the University of Athens, Pharmacien to the King of Greece, &c..

TRANSLATED AND COMMUNICATED BY DANIEL MANBURY.

VARIOUS plants of the genus *Cistus* are found dispersed over the whole island of Cyprus, but occur in abundance only in the neighbourhood of Baphos, a small town surrounded by lofty mountains. The plants (which in this locality appear to have a more powerful and balsamic odour, and to exude more resin than those elsewhere) are called by the inhabitants of Cyprus *Ευστάρια*, *Xystaria*, a word probably corrupted from the ancient name *κίστος*, *Cistus*.

On account of the fresher and more abundant vegetation in the neighbourhood of Baphos, the shepherds resort there for pasturage for their flocks, and it is while feeding in these situations that the sheep collect the viscid exudation of the various species of *Cistus* growing on their feeding ground. These species are *Cistus villosus*, *C. salviæfolius* and *C. Creticus*, and their exudation attaches itself not only to the beard, but also to the tail and to the fleece in general of the sheep, which after some months of pasturage become covered with resinous masses of labdanum.

In addition to the *Cistus*, various other glutinous plants equally agreeable to the sheep occur, and chiefly in moist and well-watered situations. These plants, to which the names *κώνυξα*, *βρώμιτσα* and *ψύλλιστρα* are applied, are *Erigeron viscosum*, *E. graveolens*, *Inula Critanmica*, *I. odora*, and being still more gummy than the *Cistus* itself, contribute even a larger amount of resinous matter to the sheep than that plant.

The names *ψύλλιστρα* and *κώνυξα* are derived from *ψύλλος* a flea, and *κόνυφ* a mosquito, on account of an attraction possessed by the plants for these insects, of which property, and their glutinous nature, advantage is sometimes taken by suspending small bunches of them over the beds in order to attract and detain these troublesome creatures.

When the shepherds observe that no enlargement of the resinous masses takes place, they commence collecting them by means of a large comb, convenient for the purpose, called *λαβδανόντενα* or *κτένιον του λαβδάνου* (*Labdanum comb*), and to obtain by fusion the resin they contain. This fusion is effected in pots of clay, and the resin more or less purified, then receives its various forms.

Cyprian labdanum which is truly *Labdanum e barbâ*, is met with in two states, namely in sticks (*Labdanum Cyprium in bacculis*) and in irregular masses (*Labdanum Cyprium in massis*).

In order to compensate for the loss of fragrance which the admixture of the resin of the *Erigeron* and other plants would occasion, various odoriferous substances are frequently added. Of these the chief is mastich, that being one of the most esteemed and usual of oriental perfumes.

The labdanum when fresh, is packed in little wooden cases, leaves of the bay-tree or more commonly of the *Ceratonia siliqua*, being laid between the pieces in order to prevent their adhesion.

The residue after the fusion and purification of the labdanum, is employed by the Cypriots in the preparation of certain balsams and plasters called *Labdanobalscham* and of an oil called *Labdanoladon*, i. e. labdaniferous oil, for which purposes it is combined with turpentine or oil of sesamé.

Labdanum is regarded by the Turks as a preservative from the plague, and was formerly considered to be a real *specificum antipestilential*; but after the happy period of the disappearance of that disease from Turkey, the employment

[* For an account of this plant, vide *Tournefort's Voyage into the Levant*, English edition, London: 1718, Vol. i, p. 60.—D. H.]

of the drug began to diminish. During the plague men affixed pieces of labdanum to their walking sticks, and wore amulets of it on the person, while the females, less exposed to the influence of the disease, carried pieces of the resin in the hand, regarding the odour as a preservative from the malady. Frictions with an oily solution of labdanum were employed, as indeed the application of oil itself, either by friction or as a bath, has usually been looked upon as one of the most efficacious preservatives from the complaint. This oily solution is employed in Cyprus as a remedy against catarrhal and rheumatic affections, and is regarded as so efficacious that each father of a family endeavours to obtain from two to three okkas [$5\frac{1}{2}$ lb. to $8\frac{1}{2}$ lb. Av.] for the use of his household, as well as a supply of dried *Cistus* leaves called *ῥῆα*, which are used against catarrh in the same way as the leaves of *Salvia pomifera** in Greece, and those of *Dictamnus Creticus* in Candia.

The dealers occupied in the collection of Labdanum, and who purchase it from the shepherds, are called *Labdanemporoi*.

The quantity annually produced depends much on the state of the weather, but it never exceeds 900 or 1000 okkas [2526 lbs. to 2807 lbs. Av.]

The price is also very various, being affected by the colour, odour, and consistence of the drug. That of a deep brown, and such as fuses most readily is preferred. In order to examine this latter quality, a morsel of the drug is placed on the edge of a *Mangal* (the name applied in the East to a copper stove, which when filled with lighted charcoal is placed in the middle of an apartment) and if the Labdanum very speedily fuses into a transparent liquid, it may be regarded as of the best quality.

[The Pharmaceutical Journal for January, 1851, contains Dr. Landerer's account of the collection of Candian Labdanum (*Labdanum Creticum*), to which he now adds the foregoing descriptive notice of the same drug as produced in the island of Cyprus. Both these accounts confirm in an interesting manner the accuracy of older writers, and as strikingly exemplify the persistent character of Eastern customs.

The description of the collection of Labdanum given by Dioscorides, who lived in the first century, equally applies at the present day. It is as follows: "Est et alterum cisti genus, *ledon*, a nonnullis appellatum, frutex simili modo nascens, longioribus foliis et nigrioribus quæ verno tempore quiddam contrahunt pingue. Foliorum vis astringens, atque effectus cisti præbens. Fit ex eo quod *ladanum* dicitur. Siquidem cum cisti frondes pascuntur capræ hircique, pinguedinem conspicue barba carpunt, et suo lentore villosis cruribus adhærescentem reportant, quam depectentes incolæ, colantesque cogunt in offas, et ita recondunt. Alii vero attractis funiculis, insidentem fruticibus lentorem abstergunt, conglomerantque in *ladanum*."—*Pedacii Dioscoridis Anazarbei de Medicinali Materia*, fol. 1516, lib. 1, cap. 130.

Pierre Belon, a French physician and traveller of the sixteenth century, in his "*Observations de Plusieurs Singularitez & Choses Memorables trouuées en Grece, Asie, Judée, Egypte, Arabie, & autres pays estranges*." Paris. 1555, faithfully narrates the mode of collecting the drug in the island of Crete, in which account he is entirely confirmed by Tournefort, who was an eye-witness of the operation in July, 1700. Vide *Tournefort's Voyage into the Levant* (ant. cit.) vol. i., p. 56.

A sample of *Labdanum Cyprium in bacculis*, accompanying Dr. Landerer's paper, consists of cylindrical pieces each of 6 inches long, $\frac{3}{4}$ of an inch in diameter, and weighing about $2\frac{3}{4}$ ounces Av. Its colour externally is a deep blackish brown; internally it is paler. It possesses the usual odour of labdanum in a high degree, and sufficient softness to be easily compressible between the fingers. Burned, it afforded 37.7 per cent. of ashes, while two other samples from a different source left respectively 60.4 and 86.0 per cent. of incombustible residue.—D.H.]

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(This description of the Chemical and Pharmaceutical portion of the Exhibition, is taken partly from the official illustrated and descriptive catalogue, and partly from the statements of exhibitors, personal observation, and other sources.)

CHEMICAL AND PHARMACEUTICAL PRODUCTS.

Sect. I.—Class 2.

CLASS 2 is principally contained in the South Gallery, and is most conveniently reached by ascending the stair near the south entrance at the transept. The objects in the Class are immediately encountered on gaining the Gallery. The Class is divisible into the following heads:—*A.* Chemical substances used in manufacture. *B.* Rarer chemical substances for the scientific Chemist; and *C.* Chemical substances used in medicine.

The objects in this Class do not admit of more than a general grouping, into the chemicals of the chemical factories, and the more delicate and refined compounds produced in the laboratory. The former of these, inclusive of large specimens of alum, protosulphate of iron (copperas), and soda, are interesting as representing a department of British commerce which has grown into importance within a very recent period. The manufacture, especially of caustic and carbonate of soda on the great scale, has originated and developed itself in a degree almost unparalleled in the history of commerce within twenty or thirty years of the present time. The fires of the kelp-burners on the shores of the islands of Scotland are scarcely now extinct, when vast factories, employing large numbers of individuals, appear to produce in enormous quantities the same alkali, which was until recently scantily derived from the fused ashes of marine plants. The manufacture of this alkali, by an ingenious decomposition of common salt by the simple aid of sulphuric acid, chalk, sawdust, and coal, is now prosecuted to a vast extent for the supply of the industrial arts generally, the quantity used in medicine and pharmacy being comparatively insignificant. At some alkali works fifty and sixty tons and upwards of common salt are decomposed every week, and converted into caustic or carbonate of soda. The alum factories are not less extensive. At those establishments crystallizations on a scale emulating those of nature are constantly in progress. Some very large specimens of these crystals, and of those of other chemical compounds, are placed in the Central Avenue, some of the masses being eight feet in height. The manufacture of sulphuric acid, and of the compounds used by the dyer and calico-printer, also occupies a prominent feature of commercial enterprise. The prussiates of potash forming large masses of yellow and red crystals, and the green, but perishable crystals of copperas, are illustrations of substances largely used in the arts, and the colours and dyes produced by their assistance, present themselves in every direction, when the classes relating to textile printed fabrics are examined.

The chemical works of this country are principally situated at Liverpool, at Newcastle-upon-Tyne, and at Glasgow. The area of ground occupied by some of them equals that covered by the Exhibition Building, and in the various departments as many as five or six steam-engines are employed. The chimneys of these works are in one or two instances 500 feet in height, and the workmen employed form a little population resident in the immediate vicinity of the works.

The application of scientific chemistry to the purposes of medicine is scarcely less recent than the commercial development of chemical manufacture. Medicinal substances appeared for a period to have been overlooked by the Chemist, and little attention was given to their preparation. This cannot now be said. The specimens of vegeto-alkaloids, the minerals used in pharmacy and of their compounds—of beautiful crystalline forms, indicate the progress made in the application of philosophic chemistry to the production of pharmaceutical preparations. A variety of compounds obtained by delicate chemical reactions, and from substances requiring great carefulness in manipulation, are also included in this Class.

The whole Class, though not an extensive one, represents the growing attention of men of eminence to chemistry as a manufacture; and of men of science to the application of chemical philosophy to the processes carried on on the smaller scale in the laboratory. The same facilities which exist in this country for the prosecution of other departments of commercial and industrial enterprise have carried chemical manufactures to their present important and commanding position. The direct dependence of many of the arts upon the existence of and the accuracy of production in these chemical works cannot now be questioned.—*R. E. (Descriptive and Illustrated Catalogue).*

AUSTIN, JAMES B., *Banbury*—Manufacturer.

Decoctions and infusions of medical substances. Superphosphate of lime. Sulphate of lime or gypsum. Fine white sand, found at Todmorton, near Banbury.

BANKART, F. AND SONS, *Swansea*—Producers.

Copperas, sulphate of iron.

BARNES, JAMES BENJAMIN, 143, *New Bond Street*—Manufacturer.

Valerianic Acid—produced from the hydrated oxide of amyle, or oil of corn spirit, by oxidation with chromic acid.

Valerianate of potassa and soda—employed in the formation of most of the following salts:—Valerianate of ammonia, baryta, strontia, lime, magnesia, alumina, oxide of chromium, protoxide of nickel and cobalt, and oxide of manganese.

Valerianate of oxide of iron, sesquioxide of iron, and oxide of zinc—employed in medicine as tonics and antispasmodics.

Valerianate of oxide of lead—oxide of silver—suboxide of mercury—oxide of mercury—teroxide of bismuth—oxide of copper—oxide of cadmium—teroxide of antimony—oxide of tin—morphia—quina—cinchonina—strychnia—and oxide of ethyle.

[An extensive and very interesting series of valerianates.—Ed.]

BASS, JAMES, 81, *Hatton Garden*—Inventor.

Specimens of concentrated medicinal infusions and decoctions, intended to obviate the inconveniences connected with infusions and decoctions as usually prepared.

BELL, JOHN, AND CO., *Oxford Street*—Manufacturers.

Cod-liver oil, stearine from cod-liver oil, simple and compound extracts of sarsaparilla, English and foreign oils of lavender, benzoate of ammonia, iodide of iron, extract and tincture of Indian hemp, juice of taraxacum, &c.—BELL, JACOB. Five Specimens of Salt, from the Droitwich Patent Salt Works.

BELL & CO., 2, *Wellington Street, Goswell Street*.

Mineral paints, which quickly dry under water, and on metals exposed to extreme heat. They are suitable for ships' bottoms, or for damp walls.

BLUNDELL, SPENCE & CO., *Hull*, and 9, *Upper Thames Street*—Inventors and Manufacturers.

Brunswick or Chrome Greens, of various tints and shades, used in oil painting and paper-staining.

Greens.—For painters, paper-stainers, &c., having a base of copper, viz., emerald green, green verditer, mineral greens, &c. &c.

Blues.—Chinese, Prussian, refiners, verditers, ultramarine, &c.

Ochres.—Yellow, red, brown, &c.

Yellows.—Chromes, all shades, King's Yellow, patent yellow, Dutch pink, &c. &c.

Reds.—Red chrome, mineral and vegetable reds.

Lakes.—Carmines. Lakes of all colours and shades.

Browns.—Vandyke brown, umbers, terra de Sienna, York brown, &c.

Blacks.—Vegetable, animal, and mineral.

Whites.—Oxide of zinc, Creunitz white, flake white, enamel white, satin white, Paris white, barytes (sulphate and carbonate), &c.

Leads.—Red, orange, grey, black, white (carbonate). White lead (oxi-chloride); a new invention, patented by H. L. Pattinson, Esq., of Newcastle-upon-Tyne.

Paints ground in oil, of every colour and variety of shade. Zinc white paint.—Unaffected by sulphurous gases, employed for a delicate dead white oil paint. Also a specimen of new drying oil, which assists its drying without impairing the delicacy of colour. Permanent and Paris green paints. Brunswick green paints. Metallic red paint. Anti-corrosion, of all colours and shades. Stucco Paint.—An oil paint used with water; invented by the exhibitors. Patent dryer. Composition for ship's bottoms. Oils.—Linseed oil, raw, refined, and boiled. Rape oil.—Rape oil.—Brown, refined for locomotive engines, and double refined for burning in lamps.

Varnishes for coachmakers.—Body, carriage, filling, black japan.

Varnishes for painters.—Oak, mahogany, black japan, furniture japanners' gold size, quick-drying copal for furniture. Mastic or picture. White hard spirit. Paper varnish. Turpentine varnish.

Green varnish for Venetian blinds, &c.

Black varnish for ships and iron work.

French polish.

BOWER, J., Hunslet, Leeds—Manufacturer.

Carbonate of soda, containing 59 parts soda, and 41 carbonic acid, particularly adapted for scouring wool or woollens, as it removes grease without injuring the animal fibre.

BREAREY, WM. ARTHUR, Douglas, Isle of Man—Inventor.

Refined oil. Pure oleine, for watches, clocks, chronometers, fine machinery, and instruments; free from acid or mucilage; not affected by change of temperature, and having no chemical action on metals.

BROWN, FREDERICK, 12, Eccleston Place, Pinlco—Patentee and Manufacturer.

Colours manufactured from the oxide of zinc, applicable for painting in distemper, on porcelain and boards, for paper staining, and for oil-cloth.

The qualities of these paints are stated to be their freedom from noxious properties, their permanency, and economy. They are not acted upon by gases. Specimen board painted with various colours in zinc paint.

[Oxide of zinc is stated to be the basis of the various paints (browns, yellows, reds, blues, greens, white) in this collection.—Ed.]

BUCKLEY, J., the Trustees of the late, Manchester—Manufacturers.

Crystal of copperas, or sulphate of iron.

BULLOCK, EDWARD, & Co., Galway, Ireland.

Arran kelp, muriate, nitrate, chlorate, and sulphate of potash.

Sulphate of soda, pure sulphur, commercial iodine, pure sublimed iodine, iodide of potassium, iodide of lead, biniodide of mercury.

Preparations from sea-weed.

BULLOCK, JOHN LLOYD, 22, Conduit Street—Manufacturer.

[Semola; caffeine; kreatine; kreatinine; uric acid; allantoin; hippuric acid; urea. These are all good specimens. The hippuric acid is well crystallized. The crystals of urea are small, and indicate by their blue tinge that they have been obtained by the artificial process.—Ed.]

BURT, STEPHEN JOHN, 26, Farringdon Street—Proprietor.

Cantharides (*Cantharis vesicatoria*), imported from Russia.

Cantharidine, the active principle of cantharides, alone (in three states, viz., from solution, by sublimation, and fused) and in combination with bases. Cantharidine and potassa. Cantharidine and soda. Cantharidine and oxide of lead.

[The *Cantharis vesicatoria* of Pharmacy is an insect belonging to the order *Coleoptera*, or beetles. Sicily, Spain, and Astracan are sources of our supply. In the present instance Russia has furnished the insect, and there is a large annual importation from that country. The Russian insects are larger than those of other countries. Cantharidine is obtained from an alcoholic tincture of the powdered insect, and possesses in an intense degree the blistering properties of the powdered cantharides.—R. E., Catalogue.]

BURTON, CHARLES, 146, Holborn Bars—Manufacturer.

Chemical products:—Acids—boracic, chromic, carbazotic, gallic, pyrogallic, metallic, phosphoric, glacial and anhydrous, sulphuric anhydrous, and uric.

Alum—pure ammonia—chrome—potash—and soda alums.

Ammonia nitrate, benzoate, and oxalate; and binoxalate (impure), remarkable for the size of the crystals.

Arsenic iodide; barium chloride—oxide, and oxide hydrate; barytes nitrate; bismuth chromate and nitrate; cadmium chromate; calcium phosphuret; cerium oxide and oxalate; cobalt acetate, nitrate, phosphate, and chloride; copper protoxide and suboxide; glucina; iron sulphuret; lead nitrate, pure; lead chromate, fused; manganese sulphate; mercury nitrate, bichromate, and bicyanide; nickel sulphate; phosphate of soda and ammonia; potash, pure, potash chromate, silicate, and binarsenate; potassium iodide, bromide, and fluoride; silver nitrate; soda, pure; soda, nitrate; strontia nitrate; tin bisulphuret; tungstic acid; tungstate of soda; bitungstate of ammonia; uranium nitrate and oxide; zinc chloride and sulphate, pure; phosphorus; iodine, pure; and bromine, pure.

Soluble Prussian blue. Iodide of potassium free from alkaline re-action; exhibited by the Rev. J. B. Reade, Stone Vicarage, Aylesbury.

[The soluble Prussian blue and iodide of potassium, exhibited by the Rev. Mr. Reade, are obtained by a process which was patented a few years ago. A solution

of iodide of iron is formed in the usual way, and to this is added half as much more of iodine as the solution already contains. The solution thus formed, is poured into a semi-saturated solution of yellow prussiate of potash, containing a quantity of the salt nearly equal in weight to the iodine used in the former solution. A precipitate is formed, which, although insoluble in the mother liquor, is, when separated by filtration, soluble in pure water. The mother-liquor contains neutral iodide of potassium, which is obtained by evaporation, and purified by fusion and crystallization. The iodide thus obtained is so perfectly neutral, that on putting a crystal on a piece of turmeric paper, and adding a drop of water, the colour of the paper is not changed.—Ed.]

CHESHIRE, JOHN, jun., *Northwich*—Manufacturer.

A pyramid of best table salt, with several other specimens of salt. The salt springs in Cheshire are the greatest in Europe, and their annual production is upwards of 800,000 tons of salt.

CLIFFORD, G., 5, *Inner Temple Lane*—Producer.

Specimens of deeds, writings, books, maps, engravings, &c., injured by fire, water, age, dirt, smoke, mildew, water, &c., in a restored and unrestored state. Those with red lines round them were taken from the ruins of the great fire at Lincoln's Inn, Jan. 14, 1849.

[Specimens of parchment documents, leaves of books, &c., which have been injured by fire, &c. are exhibited with one-half of them restored without separation from the injured portion. The unrestored part is hard, horny, and brittle; the restored portion clean and flexible.—Ed.]

COLLINS, ROBERT NELSON, *Oxford Court, Cannon Street*—Inventor and Producer.

Disinfecting powder, for the removal of offensive smells.

[This powder is a mixture of chloride of lime and sulphate of alumina. See *Pharm. Journ.*, vol. x., 39.—Ed.]

COOK, THOMAS AINSLEY, *Newcastle-upon-Tyne*—Manufacturer.

Crystallized carbonate of soda. Manufactured by the Walker Alkali Company.

[This is one of several specimens in the Exhibition, which, from their size, and the boldness and beauty of the crystals, appropriately illustrate a great staple manufacture of this country. A careful inspection of the different specimens, some of which are exhibited as carbonate, one as pure carbonate, and others as bicarbonate of soda, suggests a few remarks. It may be inferred from the magnitude of the crystals, that they have been obtained during the slow cooling of large quantities of solution. The crystals of carbonate of soda are generally well defined, and some are of unusually large dimensions. The largest crystals are in the specimen from Messrs. Chance's Alkali Works, near Birmingham. The crystals of pure carbonate of soda are neither so large nor so well defined as the preceding, which is in accordance with the observation of practical men, that carbonate of soda forms the best and most regular crystals when there is a portion of sulphate of soda or some other salt in the solution. The crystals of bicarbonate of soda, are obviously the result of exposing the crystallized carbonate in an atmosphere of carbonic acid. They retain the crystalline form of the carbonate, while they essentially differ in composition, the salt having absorbed an additional atom of carbonic acid, and parted with a portion of its water of crystallization. These crystals, are, therefore, pseudomorphous.—Ed.]

COPPOCK, JOHN, *Bridport*—Inventor.

A chemical liquid for imparting the colour of mahogany and rosewood to common woods. A specimen of the prepared wood, polished, with a bottle containing the liquid; the sides of the block are left unstained, to show the natural wood.

[The liquid commonly employed for staining wood, so as to communicate to it the appearance of antiquity, is a caustic solution of potash. The same effect is also produced by the use of soap leys, simply in consequence of the free alkali contained in that liquid. Other chemical fluids are likewise used for the same purpose.—R. E. Catalogue.]

COULSON, JUKES, & Co., 12, *Clement's Lane, Lombard Street*—Proprietors.

Mineral substances used for the manufacture of paint; in their natural state and pulverized.

DAVENPORT, JOHN THISTLEWOOD, 33, *Great Russell Street, Bloomsbury*.

Iodide of iron, saccharated fifty per cent. in brilliant lamellæ, neutral and soluble, remains unaltered by the air; iodide of quinine in a neutral crystalline form; iodide of quinine and iron, in the form of syrup; iodide of iron, in the form of syrup; iodide of lead, crystals. Chloride of lead, crystals. Citrate of protoxide of iron, powder. Ammonio-citrate of protoxide of iron lamellæ. Citrate of sesquioxide of iron in lamellæ. Ammonio-citrate of sesquioxide of iron (lamellæ). Quinine, neutral sulphate, crystals, soluble. Citrate of quinine and iron, neutral soluble. Phosphate of iron, soluble lamellæ; phosphate of quinine and iron, soluble lamellæ. Benzoic acid, crystals. Caffeine, crystals. Hydrochlorate of morphia, crystals. Collodion, liquid plaster. Nitrate of silver, crystals. Fluid extract of Dandelion, prepared by spontaneous inspissation of the pure juice. Solution of bimeconate of morphia entirely free from narcotine. Preparations of cotyledon umbilicus.

DAVIES, JOHN, *Cross Street, King Street, Manchester*—Inventor and Manufacturer.

Preserved size, clear and strong, for any climate; suitable for carvers and builders, bonnet-makers, paper-hangers, and varnishers.

DAVY, MACKMURDO, & Co., *Bermondsey*—Manufacturers.

Samples of carbonate of ammonia; corrosive sublimate; calomel; benzoic acid; citric acid; gallic acid; oxalic acid; salts of sorrel; acetate of zinc; nitrate of silver; chloride of barium; nitrate of baryta; tartar emetic crystals; sulphite of soda; nitrate of ammonia; acetate of lead; glycerine; bisulphate of mercury; red precipitate; calomel in powder; pyroxanthine.

[The specimens are all remarkably good. The crystals of emetic tartar are particularly fine.—ED.]

DAUPHAIN, GORTON & Co., 17, *Wharf Road, City Road*—Manufacturers.

Four samples of ultramarine.

DENTITH, W., AND Co., *Manchester*—Manufacturers.

Ornaments of bichromate of potash, and of nitrate of lead.

Chromate of potash, prussiate of potash, and Whitby alum, used by calico-printers and dyers.

Green oxide of chromium, and oxide of zinc, used by china and earthenware manufacturers.

DICKSON, GEORGE, & Co., 46, *Dundas Street, Edinburgh*—Manufacturers.

Medicinal cod-liver, ling-liver, and skate-liver oils. Used in cases of pulmonary consumption, asthma, lumbago, rheumatism, glandular swellings, and all diseases of a scorbutic or strumous nature.

Cod-liver ointment. 90 per cent. of the constituents of the oil is contained in this ointment.

DINNEFORD & Co., 172, *New Bond Street*—Inventors and Manufacturers.

Magnesian salts, including fluid magnesia.

DUNCAN, WILLIAM L., *Sydenham, Kent*—Inventor and Producer.

Cotton waste, used for cleansing purposes by railway and steam navigation engineers, &c. Sample, in its dirty state, after having been used for railway purposes. Cotton waste after a cleansing process, by which it is again reclaimed to its original value and usefulness.

DUNCAN, FLOCKHART, & Co., *Edinburgh*—Manufacturers.

Chloroform.

[This specimen appears to be remarkably pure.—ED.]

ELLAM, JONES, & Co., *Markeaton Mills, Derby*—Manufacturers.

Emery—Granular rhombohedral corundum-stone, from Naxos, in Asia Minor, consisting of alumina, 86.0; silica, 3.0; oxide of iron, 4.0; and crocus (oxide of iron) for polishing fine steel and plated ware.

Mineral and vegetable colours (native and manufactured):

Mineral—sulphate of barytes, carbonate of barytes, carbonate of lime, selenite, cannel coal, mineral white, mineral black, blue-black, lapis calaminaris, cream ochre, gold ochre, mineral yellow, metallic red, umber, white rotten-stone, brown rotten-stone, bole armeniac.

Vegetable colours—Dutch pink, English pink, Brunswick green, Saxon green, Derby red.

ESTCOURT, SAMUEL, 2, *Green Terrace, New River Head*—Inventor and Manufacturer.
Sample of Indian blue, for the laundry.
[Indigo.—Ed.]

EVANS, F. J.
Naphthaline, from coal.

[Large quantities of this very beautiful crystalline body are obtained in the manufacture of gas, and it is at present a waste product. It is important to the gas manufacturer that it should be completely separated in the purification of the gas, as it would otherwise be deposited, and cause obstructions in the pipes. It is a hydrocarbon, consisting of $C_{10}H_8$, a suitable application for which is a great desideratum. This specimen is well crystallized, and appears to be very pure.—Ed.]

FAWCETT, BENJAMIN, late of 73, *Snow Hill*, and 7, *Sumner Street, Southwark*.

Plain and ornamental specimens in graining or flatting, produced by a kind of paint free from noxious effluvia, and adapted for purposes to which white lead may be applied.

FOWLER, JOHN, 35, *Bedford Street, Covent Garden*.
Pure benzoic acid.

FOX & BARRINGTON, 9, *Clarence Street, Manchester*—Manufacturers.

Common Salt. Brimstone (sulphur). Salt cake (of soda). Barilla, or black ash (ball soda). Soda-ash (impure carbonate of soda). Bleaching-powder. Nitrate of lead. Chlorate of potash. Super-sulphate of soda. Tin crystals (chloride of tin), Blue or roman vitriol (sulphate of copper). Nitrate of copper. Yellow prussiate (ferrocyanide of potassium). Red prussiate (ferridcyanide of potassium). White, mottled, and yellow soda-soaps.

GODFREY & COOKE, 31, *Southampton Street, Covent Garden*, and 30, *Conduit Street*—Manufacturers.

Carmine, the colouring matter of cochineal (*Coccus cacti*). Lake, from cochineal! soluble in alkalies and ammonia. Oxide of bismuth. Carbonate of ammonia, the basis of smelling salts, of spirit of sal volatile, &c.

[The carbonate of ammonia in this collection is chemically different from the hydrated sesquicarbonate of ammonia of the shops. It is the basis of "*Godfrey's Smelling Salts*," for which the house of Godfrey and Cooke has long been celebrated.—Ed.]

Oil of amber. Salt of amber (*succinic acid*). Artificial musk, and tincture of artificial musk.

[The volatile oil obtained by the destructive distillation of the scrapings of copal or dammer resin, is usually sold as oil of amber, from which it is scarcely distinguishable. The genuine oil is used in enamel painting and for the preparation of artificial musk.—Ed.]

Watchmakers' oil, for fine machinery. Spirit of sal volatile. Essence of ambergris. Tincture of myrrh, and sundry drugs and chemicals.

GODON, SEPTIMUS H., *Tenbury, Worcestershire*, and *Rutland Gate, London*—Proprietor.
Samples of native mineral waters.

These mineral waters concentrated and tested, to show their mineral constituents. A phial showing the bromine present in the waters, extracted by ether, and floating in it.

A phial with salts found in the Tenbury mineral water.

HAHNEL AND ELLIS, 9, *Sugar Lane, Manchester*—Manufacturers.

Copper and its compounds—Copper ore from the Burra-Burra mine, Australia; sheet, oxide, and sulphate of copper.

Lead and its compounds—Lead ore; protoxide of lead; nitrate of lead.

Tin and its compounds—Tin ore from Cornwall; tin granulated; tin salts, or protochloride of tin; sulphate of soda, or salt cake.

Sulphur—Rough sulphur from Sicily; roll, flowers, crystallized, lac, and black sulphur.

Archill—Orchella weed from Angola; red archill; blue archill; cudbear.

Ammonia—Muriate and sulphate of ammonia.

HALL, JOSIAH, *Queenborough*—Producer.

Specimen of copperas, from the works at *Queenborough*, in the Isle of Sheppey, with specimens of pyrites and of copperas in a granulated form. It is used in dyeing and in the composition of colours, and, in its new and granulated form, may be used for purifying gas. The pyrites are found on the shore of the north-east side of the Isle of Sheppey; about eight tons are produced weekly. The granulated form is claimed as the peculiar merit of the specimen; it is effected by a refrigerator, and is used for dry mixing.

River copperas has hitherto been objected to as being crystallized in a soft and imperfect manner: the present specimen is freed from such defects by a strict attention to the copperas bed.

HATTERSLEY, W., 15, *Lisle Street, Leicester Square*; and 136 and 137, *St. George's East*—Inventor.

Elixir sarsaparilla prepared without heat.

HAWTHORNE, ———.
Stained woods.

HEMINGWAY, A. W., *Portman Street*.

Ferric tartrates and citrates. Neutral sulphate of quinine. Shea butter.

[Messrs. Hemingway have also a collection of the new articles and preparations introduced into the present London Pharmacopœia.

The double salts of iron are extremely well prepared, and form an interesting and instructive collection. Shea butter is obtained from the kernel of the fruit of *Bassia Parkii*, which grows wild in the woods of Bambara in Africa.—Ed.]

HILLS, F. C., *Deptyford*—Patentee and Manufacturer.

Nitrate of potash (saltpetre), made by the decomposition of muriate of potash (chloride of potassium) by nitrate of soda, a patent process; the muriate of potash being obtained from sea-weed or kelp.

Dome of sal ammoniac, sublimed from rough muriate of ammonia, made from the ammoniacal liquid produced at gas works, by the addition of muriatic acid.

Cake of sesquicarbonate of ammonia, or common smelling salts, sublimed from rough sesquicarbonate of ammonia, made by the decomposition of sulphate of ammonia by carbonate of lime; the ammonia being produced at gas-works.

HOPKINS & WILLIAMS, 5, *New Cavendish Street*—Manufacturers.

Pure tannin. Crystallized chromic acid. Benzoate of ammonia. Biniodide of mercury. Pure aconitine, used in neuralgic affections. Valerianate of zinc, iron, quinine, bismuth, and of iron and quinine.

Cardole, said to be a new and powerful vesicating agent.

[Cardole is an oily substance obtained from the pericarp of the cashew-nut (*Anacardium occidentale*). It was discovered by Dr. Stædeler about four years ago.—Ed.]

Bromoform, perbromide of formyle, a new anæsthetic agent said to be of greater power than chloroform.

Iodoform, periodide of formyle.

Metagallic acid, used in photography.

Citrate of iron and quinine.

Sulphate of iron and quinine, a new and powerful tonic.

Arseniate of soda, containing fifteen atoms of water.

Iodide of iron and quinine.

HOPWOOD, HENRY, *Richmond, Surrey*—Proprietor.

Sugar of milk, crystallized in the usual manner; and crystallized at a temperature of 160° Fahrenheit, in the dark.

[The crystals obtained in the dark are very fine.—Ed.]

HOWARDS & KENT, *Stratford, Essex*—Manufacturers.

Barks yielding quinine and cinchonine, viz. 1, various descriptions of calisaya bark (*Cinchona Calisaya*). 2, Carabaya bark (*Cinchona ovata*). 3, Cusco bark (*Cinchona pubescens*). 4, Carthagena bark (*Cinchona cordifolia*). 5—8, Specimens of red, crown, grey, and loxa barks. 9, Various descriptions of barks used for adulteration. 10, *Cinchona Australis*. 11, *Cascarilla macrocarpa*. 12, *Cascarilla carua*. 13, *Cascarilla magnifolia*. 14, *Buena hexandra*. 15, *Exostema Peruviana* or *tacumez* bark. 16, *Laplacea quinoderma*.

Salts of quinine and cinchonine:—Disulphate, sulphate, citrate, hydrochlorate, phosphate, and tartrate. Quinoidine.

[An interesting, and, as regards this Exhibition, unique collection. The great experience of Messrs. Howard and Kent as manufacturers of quinine, and the fact that they have been in communication with Mr. Weddell on the subject of the identification of certain commercial sorts of cinchona barks, give confidence in the accuracy of the names attached to the different specimens exhibited.—Ed.]

Nectandra Rodiazi, or green-heart bark, and its alkaloid bebeerine.

[For an account of the green-heart bark, the tree yielding, and its alkaloid bebeerine, the reader is referred to the *Pharmaceutical Journal*, vol. iii., p. 177; vol. iv., p. 281; vol. v., p. 228; vol. vi., p. 493; and vol. xi., p. 36.—Ed.]

Refined camphor, with different kinds of rough camphor, &c.:—1, Japan or Dutch camphor. 2, China or Formosa camphor. 3, Borneo or native camphor. 4, Refined camphor. 5, Camphor in the glass in which it was sublimed.

[Commercial camphor is the produce of *Camphora officinarum*, a lauraceous tree, and is collected in Formosa (*Formosa* or *China camphor*) and in Japan (*Japan* or *Dutch camphor*).

Borneo or *native camphor* is the produce of *Dryobalanops aromatica*. It fetches an enormous price, and is only brought to this country as a curiosity. It is employed by the Chinese, who prefer it to the camphor produced in their own territory.—Ed.]

Refined borax, and articles from which it is made:—1, Commercial boracic acid. 2, Purified boracic acid. 3, Tincal, or natural borax. 4, Artificial tincal. 5, East India refined borax. 6, English refined borax. 7, Modified crystals. 8, Octohedral borax.

[Borax is now chiefly manufactured from the boracic acid imported from Tuscany. *Tincal* or *natural borax* is brought to England from the East Indies. It is the produce of Thibet. As it comes to this country it has been thinly covered with some kind of vegetable butter, probably for the purpose of preventing efflorescence, but it is said to prevent the borax evaporating!! Messrs. Howard and Kent have exhibited a specimen of artificial tincal.—Ed.]

Tartaric acid, with specimens of the argols and tartars from which it is made:—1, Argols, various kinds. 2, Tartars, various kinds. 3, Crystallized tartaric acid. 4, The same, in the first stage of manufacture. 5, Powdered tartaric acid.

Citric acid and the articles from which it is made:—1, Concentrated lemon juice. 2, Citrate of lime. 3, Crystallized citric acid. 4, Citric acid, in the first stage of manufacture.

Antimony and preparations:—1, Antimony. 2, Black sulphuret of antimony. 3, Oxy-sulphuret of antimony. 4, Emetic tartar. 5, Antimonial powder. 6, Kermes mineral.

[In this collection we observe no specimen of oxy-sulphuret of antimony made according to the London Pharmacopœia. That which is shown is the sort usually found in commerce, and is paler and brighter coloured than the Pharmacopœial preparation.—Ed.]

Silver and preparations:—1, Silver. 2, Lunar caustic. 3, Crystallized nitrate of silver.

Bismuth and preparations:—1, Bismuth. 2, Oxide of bismuth. 3, Pearl white.

Iron and preparations:—1, Iron. 2, Ammonio chloride of iron. 3, Potassio-tartrate of iron. 4, Oxide of iron. 5, Green vitriol. 6, Ammonio citrate of iron. 7, Ammonio tartrate of iron. 8, Citrate of iron and quinine.

[The preparations of iron contain several most interesting specimens. We have *ammonio-chloride of iron* in large crystals. The *potassio-tartrate of iron* is in a fine flaky form. The *ammonio-citrate of iron* is one of the finest in the Exhibition: it is in unusually large transparent rich-coloured flakes. The *citrate of iron and quinine* is made without ammonia. It is prepared by combining three-parts of dry citrate of iron with one part of crystallized citrate of quinine, and drying the compound on plates.—Ed.]

Mercury and preparations:—1, Mercury. 2, Oxide of mercury. 3, Binoxide of mercury. 4, Red precipitate. 5, White precipitate. 6, Crude calomel. 7, Crystallized calomel. 8, Calomel. 9, Hydro-calomel, sublimed under water. 10, Corrosive sublimate. 11, Sub-sulphate of mercury.

[We have four interesting specimens of calomel. One of these is in the form of a loose spongy crystalline mass fit for levigation. It has been sublimed at a somewhat lower temperature, so as to form a crystalline crust on the top of the ingredients in the pot. A second specimen is in the form of a hard, massive, crystalline cake or lump, which has been sublimed, by a higher temperature, into the head of the subliming vessel. It is more difficult to pulverize and levigate than the preceding mass. The third specimen is in the form of a fine powder, obtained by levigating the crystalline calomel. The fourth specimen is the hydro-calomel sublimed under water.

It is remarkable that the hydro-calomel does not become darkened by exposure to light; whereas, crystallized calomel, both in the massive and levigated forms, readily darken by exposure to light.—Ed.]

Magnesia and preparations:—1, Magnesian shale, 2, Magnesian limestone. 3, Epsom salts. 4, Carbonate of magnesia. 5, Calcined magnesia.

[Most of the magnesia of the shops is obtained from Epsom salts manufactured from magnesia shale at alum works (*see* Mr. Maberley's specimens).—Ed.]

Preparations of potassium:—1, Potashes. 2, Pearl-ashes. 3, Carbonate of potash. 4, Bicarbonate of potash. 5, Sulphate of potash. 6, Soluble tartar. 7, Commercial saltpetre. 8, Purified nitre.

Preparations of sodium:—1, Soda-ash. 2, Subcarbonate of soda. 3, Subcarbonate of soda, absolutely pure. 4, Sesquicarbonate of soda. 5, Bicarbonate of soda. 6, Rochelle salt in the first stage of manufacture. 7, Pure Rochelle salt. 8, Rochelle salt, powdered. 9, Phosphate of soda. 10, Cubic nitre. 11, Purified nitrate of soda. 12, Glauber salts. 13, Hyposulphite of soda.

[The subcarbonate (*i. e.* carbonate properly so called) of soda perfectly pure, deserves especial examination, on account of the peculiarity in the aggregation of the crystals. There is a similar salt in the collection of Matthes and Weber, of Duisburg.—Ed.]

Zinc and its preparations:—1, Zinc. 2, Oxide of zinc. 3, Acetate of zinc. 4, White vitriol.

[A large portion of the oxide of zinc of the shops is either carbonate of zinc or subsulphate of zinc.—Ed.]

Iodine and its preparations:—1, Seaweed, yielding iodine. 2, Kelp. 3, Commercial iodine. 4, Resublimed iodine. 5, Hydriodate of potash. 6, Biniodide of mercury.

Opium and its preparations:—1, Opium. 2, Morphia. 3, Acetate of morphia. 4, Muriate of morphia.

HUMFREY, C., *Farnham Place, Southwark*—Inventor and Manufacturer.

Colours produced by the combination of fatty acids with metallic oxides and peroxides. Candles and refined fatty matters.

HURLET CAMPSIE COMPANY, *Glasgow*.

Alum. Red and yellow prussiates of potash.

[These red and yellow prussiates of potash are the finest in the Exhibition.—Ed.]

HUSKISSON, J. W. & H., 77, *Swinton Street, Gray's Inn Road*—Manufacturers.

Crystals of the following chemical substances:—

1. Bicarbonate of soda.—2, 3. Rochelle salts, refined and unrefined.—4. Iodide of potassium.—5. The same, commercial.—6. Iodide of lead.—7. Biniodide of mercury.—8. Iodide purified.—9, 10. Tartaric acid and citric acid crystals.—11. Acetate of zinc.—12. Sulphate of potash crystals.—13. Purified sulphate of zinc.—14. Phosphate of soda.—15. Sulphate of iron crystals.—16. Carbonate of soda.—17, 18. Purified nitrate and bicarbonate of potash.

[There are some fine crystals of iodide of potassium in this collection.—Ed.]

JENKINS, WILLIAM HARRY, *Truro*—Inventor.

Arsenical Powders—"Arsenical compound:" a general preventive of foulness, barnacles, &c., on ships' bottoms, buoys, &c., and of dry-rot in buildings.

JENNINGS, H. C., 97, *Leadenhall Street*.

Starch, gums, and vegetable wax, from potato and wheat starch.

JOHNSON, J. R., 12, *Bankside*—Inventor.

Extract of munjeet. Patterns of calico printed and dyed with the extract. Extract of madder. Patterns printed "topically" with the extract. Exhibited to illustrate a new process of extracting, economically, the colouring principle of the Rubiaceæ.

Printed calicoes to illustrate a new process of madder dyeing, which is intended to replace garancine.

Pieces of calico printed topically with extract of madder.

[Extract of munjeet, or munjeeth, is obtained from the roots of *Rubia cordifolia*, an East Indian plant. It is imported into England from Calcutta. It is not so largely used as madder, which is furnished by the roots of another plant allied to *Rubia cordifolia*. The colour produced is said not to equal that of madder in brilliance and permanence.—R. E. *Catalogue*.]

KANE, WILLIAM JOSEPH, *Dublin*—Manufacturer.

Specimen of salt cake (sulphate of soda), made in brick furnaces, with complete condensation of the muriatic acid evolved.

Specimen of bleaching powder, made from the muriatic acid condensed.

Specimen of iron pyrites (bisulphuret of iron), from Messrs. Williams and Sons' Tigrony mines, county Wicklow, Ireland.

Specimen of Manganese ore, containing ninety per cent. of peroxide of manganese, from Glandore mines, county Cork, Ireland.

KEATING, THOMAS, 79, *St. Paul's Churchyard*.

Jalap root, from Asia Minor—Hay-saffron, from Asia Minor—Kousso, or *Brayera anthelmintica*, from Abyssinia—Matico, or *Piper angustifolium*, from Bolivia—Sarsaparilla root from Paraguay.

[Externally this sarsaparilla looks as if it had been dyed with logwood. It is stated on the ticket attached to it to be the produce of *Smilax papyracea*.—Ed.]

KENT, JAMES HENRY, *Stanton, near Bury St. Edmund's*—Producer.

Dried Pharmaceutical indigenous plants, in glass vessels, the lower parts of which exhibit the plants prepared for Pharmaceutical purposes, and the upper portions of some of which display the botanical characters of the plants.

Powdered conium, digitalis, and other indigenous Pharmaceutical plants.

Dried roots of indigenous Pharmaceutical plants.

Dried immature poppyheads, and extract made from the same.

Specimens of Pharmaceutical extracts, prepared from indigenous plants.

[Excellentlly prepared. This collection does Mr. Kent great credit. The dried flowers of colchicum, digitalis, and malva retain the brilliant hues of the fresh flowers. The powder of conium is of a beautiful green colour.—Ed.]

KING, WILLIAM WAUDBY, *Soho Street, Liverpool*—Manufacturer.

Effervescent citrate of magnesia.

KURTZ and SCHMERSAHL, *Cornbrook Works, Manchester*—Manufacturers.

New colouring matters, and preparations for printing and dyeing in cotton, linen silk, and wool.

Specimens of printing and dyeing by means of the preparations.

Ultramarine, in different qualities.

[Lapis lazuli is usually found in granite and crystalline limestone. The finely-coloured varieties are employed for vases, in mosaics and furniture, and are much prized. The pigment ultramarine is prepared from the mineral, by slightly igniting it, shaking the mass in water, and after reducing it to fine powder, mixing it with a resinous paste. This paste is then kneaded in cold water, which washes out the ultramarine, the impurities being retained by the paste. From the costliness of ultramarine, its use was formerly confined to the artist; since, however, the discovery by M. Grumet (guided by the analysis of the pigment by M.M. Clement and Desormes) of a method of preparing it artificially, its price has become gradually so much reduced as to admit of its very general employment in the arts. For, although M. Grumet kept his process a secret, M. Gmelin and other chemists have published prescriptions for its production, and its manufacture has been of late years much extended, particularly in Germany, though only very recently introduced into

England. Ultramarine is a very permanent colour under atmospheric influences, but is decolorized by the presence of acids with liberation of hydrosulphuric acid, hence, in its employment, the presence of acids should be avoided. Artificial ultramarine may be prepared, according to C. Gmelin, by rapidly igniting a mixture of equal parts of silica, carbonate of soda, and sulphur, first adding a sufficient quantity of a solution of soda to dissolve the silica. The result is a bluish-green mass, which, by ignition in contact with air, becomes blue. Ultramarine consists essentially of silica, alumina, soda, and sulphur; a small quantity of iron appears to be beneficial, but an excess impairs the beauty of the colour.—W. D. L. R. *Catalogue*.]

LAMPLOUGH, HENRY, 88, *Snow Hill*—Inventor and Proprietor.

1. Socotrine Aloes, obtained from *Aloe perfoliata*.—2. Common Aloes, from *Aloe Barbadosensis*.—3. Smyrna Opium, from *Papaver somniferum*. Nat. Ord., *Papaveraceae*.—4. Myrrh, from *Balsamodendron Myrrha*. Nat. Ord., *Burseraceae*.—5. Russian Castor, from Castor Fiber. Class, *Mammalia*. Order, *Rodentia*.—6. Aleppo Scammony, from *Convolvulus Scammonia*. Nat. Ord., *Convolvulaceae*.—7. Brown Annulated *Ipecacuanha*, from *Cephaelis Ipecacuanha*. Nat. Ord., *Cinchonaceae*.—8. Red Annulated *Ipecacuanha*.—9. English Rhubarb. —10. Dutch Trimmed Rhubarb. —11. Chinese or Indian Rhubarb.—12. Russian Rhubarb.

Residual salts from the destructive decomposition of animal substances. Specimens of chlorophosphate of soda and potash; of effervescing salts; of crystals of prussiate of potash; and of sulphate of iron.

Specimen of Prussian blue.

LAWRENCE, WILLIAM, 163, *Sloane Street*—Manufacturer.

Specimens of cod-liver oil.

LEA, ALFRED, 150, *Oxford Street*—Inventor.

Myrrhine, a preparation for medical use.

[A nostrum which we are told "enables the stomach to part with any quantity of food without inconvenience or injury to the digestive organs."—Ed.]

LEE, CHARLES, 119, *Lower Thames Street, City*—Importer.

New black dyeing material for dyeing silk.

LEIFCHILD, J., *High Hill Ferry, Upper Clapton*.

Specimens of dyes for silk.—Carmine from safflower, blue from indigo, and blue from prussiate of potash.

LINDSAY, G., *Sunderland*—Manufacturer.

Green vitriol, or copperas of commerce, a protosulphate of iron, extensively used in dyeing silks, woollens, and cottons, making writing inks, Venetian red, &c. It is manufactured from iron pyrites, procured from the coal mines, exposed to air and moisture; the excess of acid being saturated by digesting the lixivium with iron plates and turnings.

LINSLATER, J., 5, *Sidney Street*.

Cod-liver oil.

THE LONDON DRUGGISTS.

Balsams, &c.: Copaiba, storax calamita, black Sonsonate, white Sonsonate, balsamito, and of Tolu.

[Black Sonsonate balsam is better known by the name of Balsam of Peru. White Sonsonate balsam is procured from the fruit of the same tree. It is, however, not the produce of Peru but of Sonsonate. Balsamito is a tincture of the fruit of the tree which yields the black balsam. See *Pharmaceutical Journal*, vol. x., pp. 280—290. A dried specimen of the leaves and fruit of the *Myrospermum* from which these substances are obtained has been placed in the collection by Dr. Pereira.—Ed.]

Barks: Canella, cusparia, winter's, mezereon, cascarilla, Simaruba, Mudar, pomegranate, crown, ashy crown, loxa and jaen.

[The bark called Mudar is the produce of *Calotropis gigantea*, from St. Kitts. The East Indian Mudar is probably the *Calotropis procera*.—Ed.]

Extracts, &c.: Dragon's blood, catechu, liquorice, aloes, churru and rhatany.

Expressed oils: Mace, cod-liver, linseed, castor, and croton.

Essential oils: Peppermint, mint, dill, anise, angelica, geranium, citronelle, cloves, cinnamon, camomile, winter green, ginger-grass, cubebs, cajuputi, verbenia, Indian grass, bitter almonds, lavender, sassafras, &c.

[Oil of citronelle, or oil of lemon-grass, is used in perfumery under the name of

oil of verberna. It is imported from India, and is the produce of a grass known to botanists as *Andropogon citratus*, and by some persons considered to be identical with *Andropogon Schenanthus*.

Ginger-grass oil, or the grass oil of Nemauro, is also brought from India. It is the produce of another species of *Andropogon*, called by Dr. Royle, *A. Calamus aromaticus*. This grass is believed to be the *sweet calamus* and *sweet cane* of Scripture.

Oil of geranium is imported from Turkey, and is used for adulterating otto of roses. It is either identical with, or closely allied to, ginger grass oil.—Ed.]

Roots: Rhubarb, orris, cassava, angelica, mezereon, calumba, hellebore, ipecacuanha, marshmallow, rhatany, smilax aspera, sarsaparilla, ginseng, salep, pareira brava, valerian, colchicum cornus, cuscus or vitiver, &c.

[Cassava root is the produce of *Manihot Janipha*. It abounds in starch. Cassava meal, cassava bread, cassava starch (or tapioca flour) and tapioca, are prepared from it.

The root marked *Smilax aspera* is the produce of the plant whose name it bears. It must not be confounded with the root of the Indian Sarsaparilla (*Hemidesmus Indica*) falsely called in commerce *Smilax aspera*.

A bale of Cuscus or Vittiver (*Vittie-Vayr*) deserves notice. This root is brought from India, and is the produce of a grass known to botanists as *Andropogon muricatus*. It is principally imported for perfumery purposes. As a medicine it acts as a gentle stimulant and diaphoretic. In India, scent-baskets, ornamented with the green elytra of a beetle, are made with this root; and in the Indian collection of the exhibition many specimens of these baskets are to be found.—Ed.]

Fruits or Seeds: Cardamoms, castor oil, croton oil, colchicum, cummin, anise, cedron, angelica, cocculus indicus, &c.

[The cedron is the seed of a simurabaceous plant, called *Sinaba Cedron*, growing in New Grenada, &c. It is a reputed antidote against the bites of venomous snakes. Its active principle has been named *cedrine*. For a figure and further details of this plant see the *Pharmaceutical Journal*, vol. x., pp. 344, 472, 518, and 560.—Ed.]

Woods: Calumba, quassia, jalap, guaiacum, myrospermum of Sonsonate, sanders, &c.

[Columba wood is the wood of *Menispermum fenestratum*. See *Pharmaceutical Journal*, vol. x., p. 321.—Ed.]

Spices, peppers, &c.: Guinea pepper, chillies, nutmegs, mace, cassia lignea, cinnamon, cubeb pepper, cloves, almonds, calamine, camomiles, patchouli, gunjah, manna, litmus, crabstones, pearls, red coral, dolichos, lactucarium, chiretta, &c.

[Patchouli is the dried herb of a labiate plant, growing in Penang and the Malayan peninsula, and called *Pogostemon Patchouli*. It is used as a perfume. See *Pharmaceutical Journal*, vol. iv., p. 80; and vol. viii., p. 574.]

Gunjah, commonly called *guaza*, is the dried hemp plant of India (*Cannabis sativa* var. *Indica*.)

Some specimens of real crabstones (the produce of *Astacus fluviatilis*) deserve notice.—Ed.]

Fruits, &c.: Colocynth, pomegranate, tamarinds, vanilla, tonka, and cassia fistula.

Gums and Resins: Ammoniacum, bdellium, frankincense, galbanum, gamboge, benzoin, styrax, larch turpentine, New Holland resin, mastic, myrrh, Arabic, olibanum, sarcocol, scammony, opoponax, sagapenum, tragacanth, tacamahac, guaiacum, &c.

[New Holland resin is the produce of a *Xanthorrhæa*. It may be used as a source of cinnamic acid.—Ed.]

Leaves, &c.: Petals of damask and cabbage roses, senna, buchu, kousso, myrospermum, &c.

[A fine dried specimen, framed, of *Brayera anthelmintica*, given by M. Rochet d'Heri-court to Dr. Pereira, has been placed in this collection.—Ed.]

Mosses: Ceylon, Corsican, Iceland, and Irish.

McCulloch, Charles, Covent Garden Market.

English and American herbs and roots.

[An interesting collection of American dried herbs.—Ed.]

Macfarlan, John Fletcher & Co., 17, North Bridge, Edinburgh—Manufacturers.

Series illustrative of the manufacture of the salts of morphia, embracing opium, impure muriate of morphia, pure muriate, and sulphate of morphia.

Specimens of gallic and tannic acids, embracing galls; tannic acid, impure and pure; gallic acid, impure; commercial, pure.

Specimens of sulphate of bebeerin, from green-heart bark, embracing the bark, and impure and commercial sulphate and of the alkaloid.

[These are all good specimens.—Ed.]

Marshall, John, Leeds—Manufacturer.

Nos. 1, 2, & 3. Acid and neutral extracts of indigo.—4 & 5. Carmine and liquid extract from purified indigo.—6. Refined indigo.—7 & 8. Red and blue orchil paste.—9 & 10. The same, of medium quality.—11 & 12. The same, of fine quality.—13 & 14. Red orchil liquor for silk dyeing.—15 & 16. Concentrated red and blue orchil liquor.—17 & 18. Cudbear.—19 & 20. The same of good and best quality.—21 & 22.—Violet carmine, and best concentrated cudbear.—23, 24, 25, & 26. Valparaiso, Angola, Madagascar, and Cape de Verd orchella weed.—27, 28, 29, 30, 31, 32, 33, & 34. Ground lac-dye. X, OO, O, A (medium quality), D (medium quality), G (good quality, H (fine quality), and I (finest quality).—35. Essence of lac-dye.

[The lac dyes are prepared by extracting the peculiar colouring matter of the "stick-lac" of commerce. This latter is a resinoid substance, the result of a secretion of several different plants—the *Ficus Indica*, *F. religiosa*, *Croton lacciferum*, and others, occasioned by the punctures of a small insect (the *Coccus ficus*) made for the purpose of depositing its ova. The branches become encrusted with a reddish-coloured concretion, which consists of the inspissated juice of the plant, imbued with a peculiar colouring matter derivable from the insect. The preparation of them is usually carried out in India, the remaining substances, seed-lac and shell-lac, being also articles of commerce. The colouring matter, or dye, is extensively used as a substitute for cochineal.—E. F.—Catalogue.]

Ground Bengal turmeric.—Specimens of 36 kinds of European and native manufacture of lac-dye in India.

Mason, Charles, and Son, 11, Munster Street, Regent's Park—Manufacturers.

Royal premier blacking. French and waterproof varnish.

Mason, Mrs. B., 38, Doughty Street.

Pooloo's Chinese cement.

May & Baker, Battersea, Surrey—Manufacturers.

Specimens of nitric acid. Crystals of nitrate of silver. Trisnitrate of bismuth. Rough camphor, as imported. Refined camphor in refining glass; camphor, prepared for sale. Precipitated chalk. White precipitate of mercury. Corrosive sublimate. Crude calomel. Prepared calomel. Red precipitate of mercury. Turpith mineral. Ponderous magnesia. Acetate of potash; acetate of zinc. Oxide of zinc. Sulphate of zinc, and chlorate of potash.

[The chemicals of this collection are of excellent quality. There is a fine large dome of crystallized calomel, which is becoming dark by exposure to light, as is the case with other specimens of the same kind in the Exhibition. The powdered calomel in this collection has undergone but very little discolouration, from which it may be inferred that it is not prepared by powdering the sublimed crystals. Some of the observations on Messrs. Howard's specimens, are applicable also to those of Messrs. May and Baker. The refined camphor is remarkably fine; that which is left in the subliming vessel retains its transparency unimpaired.—Ed.]

Melincrythan Chemical Company, Neath, Wales—Manufacturers.

Sugar of lead, or acetate of lead.

[A mass of beautiful crystals.—Ed.]

Moberley, W., Mulgrave Alum Works, Sandsend, near Whitby—Producer and Manufacturer.

Raw alum shale, as cut from the cliff, showing embedded nodules of cement stone; the same after calcination. Alum meal, or alum as first crystallized. Half a cask of finished alum.

Rough sulphate of magnesia, being the residuum obtained in the manufacture of alum, used for making refined Epsom salts. Refined sulphate of magnesia, or Epsom salts, purified by a new patent process.

[The rough sulphate by exposure to air and light is becoming covered with a ferruginous coat.—ED.]

Patent double salt of ammonia and magnesia, for a manure for top-dressing.

Bones dissolved in sulphate of magnesia, for a manure.

[Alum manufactured at Whitby by the combustion of the schists of the upper lias, which contain a certain quantity of iron pyrites and bituminous, or carbonaceous matter. The temperature being properly regulated, and water occasionally supplied, a double decomposition takes place, producing sulphate of alumina and sulphate of iron, together with a portion of sulphate of magnesia, if any magnesia is present in the alum schist. A subsequent separation of the ingredients takes place. A certain quantity of the sulphate or muriate of potash is added, and the alum is crystallized. Alum is a triple salt consisting of a hydrated sulphate of alumina and potash, soda, or ammonia; but a portion of the alumina is occasionally replaced by iron.—D. T. A.—*Catalogue*]

MORSON, THOMAS, N. R. & SON, 19, *Southampton Row*—Manufacturers.

Specimens of crystallized salts of morphine, strychnine, cinchonia, with the pure alkaloids from which they are obtained, of pure aconita and veratric, gallic, tannic, hippuric, salicylic, and meconic acids, pyro-gallic and pyro-meconic acids, kreosote, furfural, furfuramide, nitrate of furfural, chloride of nickel, &c.

[This collection consists chiefly of the rarer or higher class chemicals for the scientific chemist. The sulphate [acid-sulphate?] of strychnia is in remarkably fine crystals. Furfural is an oil produced by the action of sulphuric acid on bran. It was obtained by the late Mr. Fownes from a viscid oil given to him by Mr. Morson. Its formula is $C_{15}H_8O_4$. Furfuramide ($C_{15}H_8NO_4$) is the product of the action of ammonia on furfural. Furfurine ($C_{30}H_{12}N_2O_6$) is a vegeto-alkali produced by the duplication of the elements of furfuramide. For further details see *Pharmaceutical Journal*, vol. v., pp. 414-423. The medicinal properties of these compounds require investigation.—ED.]

MURRAY, SIR JAMES, M.D., *Monkstown, Dublin*—Inventor.

Bicarbonate of magnesia, dissolved in distilled water; free from impurities. Specimen of fluid camphor and magnesia. Carbonate of magnesia in crystals, a dentrifrice.

NAYLOR, WILLIAM, 56, *James Street, Oxford Street*—Manufacturer.

Decorative copal varnish, made from Sierra Leone gum copal. White hard varnish, made of picked gum sanderach; and mastic varnish, made of picked gum mastic. New glass ventilators, opened and shut by the means of a rack and pulley, as a sun-blind.

Specimens of deal wood, stained to imitate different woods, without sizing; calculated to endure exposure, and admit of polish or varnish. The novelty claimed is the production of the stain without sizing.

NISSEN, HILARY, & PARKER, GEORGE, 43, *Mark Lane*—Inventors.

Specimens of tinted paper, chemically prepared in the pulp, for printing bank cheques upon. The chemical preparation renders any extraction of the writing by acids or alkalis immediately apparent.

NIXEY, W. G., 22, *Moor Street, Soho*.

Cement.

(To be continued).

CHEMICAL REPORT ON THE METROPOLITAN WATERS.

In reference to this subject, we have before us the Report and papers of suggestions on the proposed gathering grounds for the supply of the Metropolis from the soft-water springs of the Surrey Sands, addressed to the General Board of Health by the Hon. William Napier; a Report on the Water of the West Middlesex Water-Works Company, by Dr. Alfred S. Taylor and Mr. Arthur Aikin, and, lastly, the Report of the Government Commission on the Chemical Quality of the supply of Water to the Metropolis.

Mr. Napier's Report is that on which is founded the proposition of the Board of Health, that the metropolis should be supplied by Government with soft water obtained from gathering grounds to be established in the neighbourhood of Farnham. It contains evidence from different sources relating to the quantity and quality of the water issuing from the various springs in the districts referred to. The conclusion arrived at is, that nearly double the quantity of water required for the supply of London might be derived from the proposed sources, and that the quality of the water thus obtained, would be very superior to that of the present supply in regard to softness and general purity.

The report of Professors Taylor and Aikin represent the water supplied by the West Middlesex Water-Works Company, to be "a good, wholesome, and potable water, free from all noxious ingredients, containing no more than the usual small proportion of mineral matter found in terrestrial waters, and admirably adapted for the supply of a town population."

The questions submitted to the Government Commissioners, Professors Graham, Miller, and Hofmann, have reference to, 1. The chemical quality of the waters now supplied to the metropolis; 2. The practicability of improving the quality of these waters; 3. The applicability of the present system of distribution to the supply of a soft water; 4. The chemical quality of the water derived from the sources suggested by the Board of Health; 5. The chemical quality of the water proposed to be supplied from Watford; 6. The properties to be preferred in the water selected for the supply of the metropolis.

These questions are all fully and ably discussed by the Commissioners in their report, which is dated June 17. With regard to the chemical quality of the waters now supplied by the water companies, the results of the analyses made by the Commissioners do not differ materially from those previously obtained by other chemists, and which have been published in this Journal. It is stated that "none of the waters had any marked taste or odour, nor betrayed any indication of putrescence, either when first taken up or after being kept in bottles for several weeks at a temperature between 50° and 60°; nor even after remaining in close vessels for two weeks at 80°.

It is further remarked that "in these waters, when submitted to microscopic examination, no animalcules were observed in any case." This agrees with our own observations, although at variance with statements which have been recently published. Some interesting remarks are made on the influence of the hardness of the waters now supplied. This quality, estimated by Clark's test, varies from 14° to 16° in the waters of the different metropolitan water companies. "The hardness of water," say the Commissioners, "forms an objection to its use both in cooking and washing, but the force of the objection to the Thames water for culinary purposes is much diminished by the large amount to which that water is softened by boiling." In connection with the use of hard water for cooking, it is stated that "the presence of much sulphate of lime in water makes it unsuitable for cooking vegetables, owing to the tendency of that salt to form an insoluble compound with their legumine, but this effect is insensible with Thames water." Some calculations are made with the view of showing the loss of soap sustained by the use of hard water for washing, from which it appears that in using unboiled Thames water for washing linen, there is a loss of about 42 per cent. of the soap employed, in consequence of its being decomposed by the lime contained in the water; and that the loss of soap amounts to about 20 per cent. when the same water has been softened by previous boiling. In connexion with this subject it is stated that "it is found proper to avoid boiling any portion of the Thames water that is used in the wash-tub, or even heating that water above a certain point, for the carbonate of lime precipitates on the linen, carrying down the colouring matter of the water with it, and producing stains, which there is the greatest difficulty in afterwards removing from the linen. The colour from the water is thus indeed fixed upon the cloth, by the precipitated lime, with the tenacity of a mordant."

With reference to the improvement of the quality of the water at present supplied, the Commissioners refer to filtration through sand as a process by which impurities may to a certain extent be removed. "But," they say, "the

insufficiency of sand-filtration alone to clarify water which flows from clay land, particularly at the season when the water is charged with decaying vegetable matter, is obvious at times in the best filtered Thames water. Many waters of considerable softness, such as the Medway, and those of the Weald of Kent, must be excluded entirely on this account, as sources of an improved supply. We doubt even whether a perfect discolouration could be commanded by filtration, either of the Lea and its higher tributaries, or of the Thames above Kingston, unless provision were made in both cases for the exclusion of flood-water. The matters dissolved in water have been observed to diminish, in particular circumstances, after sand-filtration. But any *chemical* action which a sand-filter may exercise is soon exhausted, and it would be unsafe to calculate upon advantage from it in practice." They recommend Dr. Clark's process for the removal of carbonate of lime from the water, together with a portion of organic and colouring matter, by adding to it a proper quantity of caustic lime, both as a practicable process on the large scale at a moderate expense, and as an efficient means of reducing the hardness of Thames water from fourteen degrees to about four or five degrees. This process, however, was found not to remove the yellow flood-tinge of Thames water, or the objectionable taste of vegetable matter which the water possesses at flood-time, and it is stated that it is not to river waters that this elegant and useful purifying process is most advantageously applicable.

The report speaks favourably of the quality of the water found in the districts comprised in the proposed gathering grounds of the Board of Health, but doubts the possibility of getting the required supply from the springs, apart from the streams, in which the water is subject to contamination. It recommends in preference the water obtained from Watford according to the plan proposed by the London (Watford) Spring Water Company. This water, of which it is considered there would be an abundant supply, is not a soft water, but it is proposed that this defect should be remedied by the adoption of Dr. Clark's process. When softened by this process it is considered to be in every way unobjectionable, possessing the properties to be preferred in the water selected for the supply of the Metropolis, namely, freedom from putrescible organic matter; freedom from constant, or even occasional discolouration by clay and vegetable matter, with perfect brightness and clearness, softness and coolness.

"The water recommended," say the Commissioners, "appears to approach most closely to the standard of all that is excellent in a town supply, and is worthy of the greatest efforts and grandest works to procure and convey it. But the sources are near at hand, and the water is attainable without difficulty or great expense. With such a noble application of the chalk spring-water in view, as the supply of the Metropolis, it would be a desecration to permit that water to be wasted on other uses, and most impolitic to allow the possession of it to pass into private hands. It is our deliberate opinion, which we would enforce in the strongest terms, that the much desired and most necessary improvement in quality of the London water, is associated with these sources of supply, and will depend upon their proper application to the uses of the public."

ON ALOINE, THE CATHARTIC PRINCIPLE OF ALOES.

BY MESSRS. T. AND H. SMITH.

DURING last summer, having occasion to prepare a quantity of the aqueous extract of aloes, a preparation in repute with many medical men, we made use of cold rather than hot water as the solvent, from an impression that a more perfect, though less bulky product would be obtained by leaving in the marc a large proportion of resinous matter, which must necessarily be contained in the extract prepared from a hot solution. Further, with a view of rendering the preparation as perfect as possible, the filtered liquid was evaporated *in vacuo*, thereby avoiding an excess of heat, under the influence of which and exposure to the air, recent researches show the cathartic property of the aloes to be seriously impaired.

After the syrupy liquid had cooled, certain appearances arrested our attention, and seemed of sufficient importance to induce a departure from the original inten-

tion of forming it into a dry extract. The vessel containing the thin extract was now therefore set aside for a few days; and when again examined, the contents were found to have lost their original liquid state, and to have become loaded with a mass of granular crystalline matter. The whole was at once put into a cloth, and freed from the liquid portion by strong pressure. The crude solid substance left in the cloth being very impure, required further treatment before an opinion as to its nature could be formed, and was therefore dissolved in hot water, and filtered while still hot, out of contact with the air. On the cooling of the liquid, the substance separated in a crystalline state, and of a deep yellow colour. After a second pressure, it was subjected to another treatment exactly like the last. The solid cake resulting from the third pressure, after being completely dried, presented the appearance of an opaque straw-yellow mass, breaking short and of a dull fracture. Its taste was intensely bitter and distinctly aloetic, but entirely without smell. It was found to be quite combustible, and to leave no ash on being burned on platinum foil. Its solution acted on test-paper neither as an acid nor an alkali; it was therefore a neutral body. It dissolved in very small quantity in cold water, not above a grain to the ounce, but very readily when heated. It is very soluble in acetic ether, and also in acetic acid, of about 25 per cent., even in the cold; four grs. may be easily dissolved in a fluid drachm of either of these liquids. It lime-water it is considerably more soluble than it is in cold distilled water. Oil of turpentine and chloroform do not appear to have any solvent action on it. It is very readily dissolved by aqua potassæ and other alkaline liquids. In rectified spirit, with the assistance of heat, it dissolves in large quantity; and on very slowly cooling, out of contact with the air, it crystallizes in beautiful yellow satiny tufts of rhombic plates. The spirituous solution however refuses to give crystals unless above 40 grs to the fluid ounce of spirit be used. It is therefore very soluble in this menstruum, 12 parts by measure being capable of holding one part in solution. Weak spirit is also a good solvent, for on adding water to a strong alcoholic tincture, there is no separation. Sulphuric ether dissolves it very sparingly.

From a consideration of all these characters, we became satisfied that the substance which had been separated by us from the commercial Barbadoes aloes had never been made known before, and therefore was a new substance; but whether the interest attached to it should terminate here remained to be seen. Of course the first and most important question which suggested itself to the mind, and which remained to be solved, was,—Whether the crystalline substance, which we had now convinced ourselves was an educt, and not a product, from the aloes, possessed any of the virtues of aloes as a medicine, or whether the virtues of aloes were concentrated in it, and depended on its presence for their action upon the living body.

The first trial, with the view of ascertaining its action on the body, was made with $\frac{1}{2}$ a grain, and it acted twelve hours after being taken, in the manner that so characteristically distinguishes the action of aloes. The same quantity was again given to two healthy young men, with a similar result, except that in one about twenty-four hours elapsed before its operation. In the next two cases, 1 gr. failed to act; but in one of these, the dose having been increased to 2 grs., a very strong operation was the consequence. In a case where 4 grs. were given, the person, a patient of Dr. Robertson, Physician to the Edinburgh Royal Infirmary, had been taking $\frac{1}{2}$ gr. does of elaterium with little effect. The operation in this case was rather violent. In numerous other cases in which it was tried, it invariably operated in doses of from one to two grs. The result of these trials was the removal from our minds of every doubt of the crystalline body yielded by the aloes being that on which the cathartic action depended, being, in fact, the active principle of the drug.

To the new crystalline substance we have given the name of *Aloine*. It was obtained, as already stated, from Barbadoes aloes; and it became a question, both interesting and important, to ascertain whether it could be procured from other kinds, such as the Socotrine and Cape. With this view we therefore put these two kinds of aloes under treatment, operating in the very same way as with the Barbadoes, but without success. That the aloine is present in both of these sorts there cannot be a doubt.* In fact, we have no hesitation in stating our belief, that we shall yet obtain it from these, the result of what little we have done convincing us of its existence in them as well as in the Barbadoes sort; but by the presence of impurities, chiefly, we suspect, of a resinous nature, the aloine is probably so en-

* Since writing the above, a vessel containing a solution from the Cape aloes, and which has been put aside and remained undisturbed for a long period, has been examined, and found to contain a mass of crystalline matter, exactly of the same appearance as that first obtained from similar solutions of the Barbadoes aloes, which, we feel satisfied, will turn out to be aloine.

tangled that it cannot get freedom for that arrangement which seems necessary for ready crystallization. That a crystalline body may be present, and yet may not crystallize, will, we believe, be readily admitted by any one much occupied with the process of crystallization. Another cause may, perhaps, be found in changes and decomposition, originating in faulty processes of preparation, the result of ignorance, carelessness, or fraud. That faulty methods of preparing the aloes may be one cause of certain kinds of the drug not yielding aloine, is rendered probable by the following circumstance which came under our observation. If aloine be crystallized, either from water or rectified spirit, and the crystals left in contact with the mother-liquid, in the course of a few weeks, but more quickly in the latter than in the former case, the crystals will have then entirely disappeared, thus showing the readiness with which the aloine loses its crystallizable character. Keeping these considerations in view, and taking advantage of what little we now know of the properties of the aloine, the following steps were taken :

The watery solution of Cape aloes having been mixed with a very little sulphuric acid, to separate a quantity of colouring matter along with a fatty acid and chlorophyll, was filtered, and then evaporated *in vacuo* to a thin extract. The extract was shaken with a quantity of æther, which was then poured off, and allowed to evaporate very slowly. Aloine at length crystallized, but of course, from its slight solubility in æther, the quantity was very small; but the thick liquid, which had been washed with the æther, after standing undisturbed for a week or two, was found to have yielded a crystalline crop of aloine considerably more abundant.

The nature of the process by which the presence of aloine in the Socotrine aloes was tested by us was somewhat different from the preceding. A strong alcoholic tincture of the aloes having been prepared, sulphuric æther was added as long as any precipitate was produced. A dark-coloured compound of lime being thus taken out of the way, the æthero-spirituous solution, after becoming quite clear, was mixed with a small quantity of water. The result was a separation of the mixed liquids into two distinct portions; the one heavier, composed of most of the water and spirit and a little æther, forming the under portion; and the lighter, consisting principally of æther, but containing a little spirit and water, floating above it. The heavy liquid having been separated, was exposed to a heat of about 130° F., till the spirit and æther had completely evaporated. The watery solution now left, on cooling, gave crystals having the characteristic appearance of aloine, and a trial strengthened this belief of their nature. The lighter liquid, on slow evaporation, likewise produced similar crystals.

The solutions of aloine are wonderfully altered by the action of the air. One striking experiment made by us will perhaps place this character of aloine in as strong a light as any that could be stated. Two grs. of aloine having been dissolved in two oz. of distilled water, the solution, which was of a very pale yellow colour, was corked up in a phial that was nearly filled with it, and then set aside in a heat of about 120° F. The colour of the solution gradually passed into a fine red, deepening continually in intensity, till in a few weeks the colour had become so deep as almost entirely to obstruct the passage of light.

It may not also be without some interest to mention here the singularly striking effect of nitric acid upon the aloine. $\frac{1}{2}$ a drm. of strong commercial nitric acid being put into a test-tube, and 15 grs. of aloine gradually added, great heat and violent action are produced, with the escape of red fumes, and a perfect solution is the result. The syrupy liquid being now added to cold water, a yellow precipitate is formed, which however dissolves on adding more water; and on neutralizing the liquid with aqua potassa, a liquid of a splendid red colour is produced. The intensity of the colour is so great, that on comparing it with a liquid of equal bulk, and containing the colouring matter of two oz. of cochineal, that coloured by the aloine is of a deeper red, and even in the richness of its shade rivals the other. When the liquid is slowly evaporated, tufts of long needle-shaped crystals of chrysammate of potash are produced.

For an account of the chemical characters of aloine, we beg to refer to an article by our friend Dr. Stenhouse, in the *London, Edinburgh, and Dublin Philosophical Magazine*, for December last, from a consideration of which it will be quite obvious, that the substance we have obtained from the aloes is quite different from that described by Mr. Edmund Robiquet.†—*Monthly Journal of Medical Science*, Feb. 1841.

† Dr. Stenhouse obtained in his analysis of aloine, which had been tried at 212°, 60·72 C. 5·42 H, and 88·86 O, leading to the formula $C_{24}H_{18}O_4$; in the hydrated state aloine contains one equiv. water.—*Ed. Chem. Gaz.*

ON EXTRACTUM CARNIS AND EXTRACTUM SANGUINIS.

BY DR. BUCHNER.

It is frequently found necessary, in cases of debility and weakness, after protracted diseases, loss of blood, or in old age, to prescribe nourishing and strengthening diet. In wealthy families the orders of the physician can generally be executed by the cook; but in poor families, and in other cases where the kitchen could not supply what was required, the so-called portable soup (*consommé-oder bouillon-tafeln*) has hitherto been employed for these purposes. But this soon becomes obnoxious both to the palate and stomach on account of the gelatine which it contains, and which does not agree with our organism when taken in excess for a length of time. The refreshing, vivifying, strengthening, and sanguifying power of meat does not reside in the gelatine, but in the juice of the flesh, which may be obtained by pressure, the gelatine and fibrine remaining behind in the residual cake: the gelatine being only transformed into a soluble jelly by boiling in water.

Liebig has greatly enriched our chemical knowledge of muscular flesh,* so that we now know to a certainty the constituents of the juice of flesh. By the odour and taste of the extract of flesh, by the comfort and increased appetite which we feel after the moderate enjoyment of it, we may safely conclude that it is these crystallizable, nitrogenous educts, which are partly soluble in alcohol, which promote digestion, accelerate the circulation of the blood, and improve the formation of blood as well as the secretions.

The prismatic crystals, which appear during the slow evaporation of the watery and alcoholic solution of the extractum carnis, are *kreatin*, a neutral substance of a bitterish acrid taste. The *kreatinin*, which is analogous to a salt-base, and reacts as an alkali, remains in the mother-liquor, together with *lactic* and *inosinic* acids. Also the equally crystallizable *sarkosin*, which possesses a sweetish acrid taste, is an organic salt-base, and is probably not without some effect.

The reddish-brown amorphous proportion of the extract of flesh, which is soluble in water and alcohol, and which Thénard calls *osmazome*, possesses the peculiar odour of flesh-broth, and the stimulating saline taste of portable soup. Litmus is coloured red by it, in consequence of the *acid lactates* and *inosinates*. If the extract of flesh be obtained by alcohol the residue is insoluble in alcohol, but soluble in water; and contains, besides salts, also an amorphous animal substance of an agreeable flesh-broth taste, denominated by Berzelius *zomidin*. The salts of the extractum carnis consist chiefly of *lactates* and *inosinates*, *chloride of sodium* with a little *chloride of potassium*, *phosphate of potash*, and a very small quantity of *phosphates of lime and magnesia*.

It can hardly be doubted, that the constituents of the extract of flesh are contained as such in muscular flesh, for if the latter be finely chopped and pressed, the same substances can be extracted from the juice of the flesh as from the extract which has been prepared with cold or lukewarm water. It is, however, to be observed, that both contain albumen and caseine, which are coagulated by the free acid, at a temperature of 60° to 70° C.

These facts, two years ago, induced Dr. V. Breslau, of Munich, to have the *extractum carnis* officinally prepared, and to prescribe it in cases of weakness, &c., &c., in which it fully justified the expectations entertained of it.

Mode of Preparation.—Fresh lean beef, perfectly freed of all fat, is chopped very fine, and well triturated and kneaded in a mortar, with a small quantity of cold or lukewarm distilled water, and then pressed in a press. The residual cake is again treated in the same way. The somewhat diluted extract, which is of a reddish colour, and reacts slightly as an acid, is then heated to 70° C., or to the boiling point, the coagulated albumen and the froth removed, and the pure extract evaporated in the sand-bath to the consistency of an extract, being constantly stirred during the whole time. It may then be preserved, like any vegetable extract. The heart of the bullock yields an equally good extract as the flesh, possessing not only all the constituents of the latter, but even a greater proportion of *kreatin*, the proportion in the flesh being 1 to 1000 parts, and in the heart, according to Gregory, 1.37 to 1.41 in 1000 parts.

Properties.—The extractum carnis is of a reddish-brown colour; its consistency that of a common extract; and it possesses the tendency to attract water from the air without in the least becoming altered by long standing. It has the specific odour of portable soup, and an acidulous saline, somewhat acrid, but agreeable taste. That

* *Researches on the Chemistry of Food.* 1847.

prepared from bullocks' heart does not taste exactly like that of meat, but has a somewhat bitter taste.

In water the extract is readily and perfectly dissolved, and the solution colours litmus red. By ordinary spirit of wine it is for the greatest part dissolved, whilst the so-called *zomidin* is precipitated.

One hundred parts by weight of meat yield about six per cent. of substances soluble in cold water; of which about half consists of albumen and caseine, which are removed from the pure extract, so that the latter, including the water, amounts to scarcely five per cent. of the quantity of meat employed. The meat which has been subjected to pressure, yields when treated with boiling water, half to one per cent. of gelatine, and the residual muscular fibres, when well dried, weigh 16 per cent, so that the proportion of water in the fresh beef may be put down as 77 per cent.

By adding to the expressed juice a proper proportion of caramel (burnt sugar) the flavour and the durability of the extract are much improved.

Extractum sanguinis bovis, or *extract of ox blood*, is recommended by Dr. Von Mauthner for children under similar indications as the *extractum carnis*.

Preparation.—The perfectly fresh blood, as it comes from the slaughtered beast, is stirred till cold, then strained through a sieve, and immediately evaporated in the water-bath to dryness, being at the same time constantly stirred. When cold, it is rubbed into a powder. Of this extract Dr. Von Mauthner prescribes for children eight to ten grains dissolved in water, adding a small proportion of alcohol.

The question is now, what is contained in the extract of blood, and by what is it distinguished from the extract of flesh. The extract of blood is of a very dark reddish-brown colour, and can be dried into a friable substance. It does not possess the agreeable odour and acrid saline taste, nor the acid reaction of the extract of flesh. Its taste is rather unpleasant, almost alkaline saline, and its reaction neutral or slightly alkaline. Whilst being stirred, the fibrin separates from the fresh blood, and is removed by the sieve, and, during the process of evaporation, the albumen coagulates. The extract prepared according to Mauthner, is, therefore, only partially soluble in water. Among the constituents of the extract, soluble in water, are chiefly salts, viz., *chloride of sodium*, *chloride of potassium*, *chloride of ammonium*, *phosphate of soda*, with the *phosphates of lime and magnesia*, *sulphate of potash*, *sulphate of soda*, and *lactate of soda*; *adipate of soda*, and also the *yellow colouring matter of the bile*, called by Simon, *hæmaphæsin*, *other extractive matters* and *ferruginous hæmatine* are also present. Whether kreatin, kreatinin, inosinic acid, &c., are contained in the *extractum sanguinis*; is still doubtful.—*Buchner's Repert.*, 1851, No. xix., p. 90.

ON MEAT BISCUIT.

[In the Lectures *On the Dietetical Materia Medica*, recently delivered by Dr. Pereira at the Royal College of Physicians, "Borden's Meat Biscuit" was noticed, and specimens of it shown. We have observed, also, that samples of it are contained in the United States' Department of the Exhibition. We have, therefore, thought it desirable to publish the following account of it.—ED. PH. JOURN.]

LETTER OF GAIL BORDEN, JUN., OF GALVESTON, TO
DR. ASHBEL SMITH,

Setting forth an important Invention in the Preparation of Food, termed Meat Biscuit, and the Reply of Dr. Smith thereto, being a Letter addressed to the American Association for the Promotion of Science, at their semi-Annual Meeting, to be held at Charleston in March next.

Galveston, January 21st, 1850.

DR. ASHBEL SMITH—DEAR SIR,—Last July, while attempting to prepare some portable food for a few friends going to California, I made an important discovery, to wit, that of a new process of preserving the nutritious properties of meat; and having taken the necessary steps to secure a patent for the invention (mainly with a view to insure the integrity of the manufactured article), I am now advised to bring the discovery to the notice of the government.

To this end I have already sent specimens of the *Meat Biscuit* to several scientific and practical men; and also to surgeons and others connected with the army and navy of the United States, to whom I have also written in relation to the nature of

my discovery or invention, and its uses, requesting them to test the article, and to give me their opinion of its merits and importance.

The high eminence to which you have attained in a knowledge of the arts and sciences, induces me to request that you will notice this discovery; and I should be pleased, likewise, to have an expression of your opinion upon its merits, and the adaptability of the article to common and general use; and for your further information, permit me here to repeat what I have said to those gentlemen and others in relation to the subject:

First, then, the nature of my discovery or invention consists in an improved process of preserving the nutritious properties of meat or animal flesh of any kind, by obtaining the concentrated extract of it, and combining it with flour or vegetable meal, and drying or baking the mixture in an oven, in the form of a biscuit or cracker.

This meat bread, or as Messrs. Munn and Co., of the Scientific American, call it, "*portable desiccated soup bread*," contains a large amount of the most important alimentary substances in a very small bulk and a convenient form, well adapted to the use of seafaring persons, travellers, hospitals, public institutions, and private families.

One pound of this bread contains the essence or extract of more than five pounds of meat (including its usual proportion of bone), and one ounce of it will make a pint of rich soup; and its strength and power of nutrition may be estimated by the comparison of the small quantity which it requires to make so large a quantity of soup, to say nothing of its other great and superior advantages, which I will speak of more at large hereafter.

It has been suggested to me, to put into the composition during its manufacture, spices and other condiments; but after reflection I have concluded not to do so, for it not unfrequently happens that these articles are put into prepared meats and portable soup to conceal the bad quality of the meat of which they are made, and to disguise the offensive flavour and other defects arising from this and other causes in its manufacture, on which account many persons object to their use, whereas, the article I propose to furnish, unmixed as it is with spice, pepper, or even salt, may be judged of as to its genuineness and purity by anyone desiring to use it; nor does there seem to me to be any sufficient reason for adding these condiments, for these things require no expensive case or covering to preserve them in their original strength and purity, and may be used at the time of cooking with equal convenience, and (which is a further advantage) in such proportions as to suit the ever-varying tastes of different individuals.

Since the discovery of preserving the essence or extract of animal flesh by combining it with the staff of life, I have made improvements, not only in the manufacture, but of the mode of preparing it for use; and I entertain no doubt of the success of the meat-bread when properly tested. But, recollecting the ill-success which the Indian or corn-meal met with recently in Great Britain, on account of prejudice and ignorance as to the proper mode of cooking it, I am the more anxious that a fair trial of the article should be made by *practical* as well as professional men.

I would remark, that I expect to make a still farther improvement by the employment of suitable apparatus, by which the nutritious properties of the meat will be separated from the corporeous parts by *steam*, and the broth evaporated by means of the *vacuum process*. This is the manner in which refined sugar is made from the juice of the cane; and it is believed that the same process applied to the manufacture of the meat-bread, will exhibit as great an improvement in its strength, purity, and its cheapness, as has attended its application to the manufacture of the sugar.

I have manufactured some 600 pounds of this meat-bread, but having hitherto no suitable apparatus to apply any greater heat than boiling water, I have necessarily lost much of the nutriment contained in portions of the meat, which give to soups a richness, both palatable and alimentary.

It may be proper to remark, that I have made experiments not only with beef, but also with veal, pork, fowl, fish, and oysters; and a friend of mine at Goliad, having kindly offered to send me a tortoise of Aransas bay, I propose to make a portable soup-bread, by which such interior cities and localities as cannot supply themselves with the original animal, may be enabled to regale themselves upon the genuine "*turtle soup*." But I must further remark that beef, so far as my observation extends, makes a better article than veal. Young meats, I find, are like unripe fruits, they are tender and palatable, but not so nutritious nor so easily digested as those which are matured.

One word with regard to the invention. Perhaps it may be said that the

extracting of the essence of meat is no new thing; I am aware that it is not Messrs. Munn and Co., in a letter to me on the subject, under date of 24th October last, say, that "the mode of preparing the concentrated liquid or paste-beef, has been long known to the world, such as is described in Gray's or Liebig's Chemistry, but, as combined with flour and made into bread, as claimed by you, is entirely new to us, and we do not think any such process has ever been used before your discovery. The plan is, in our opinion, a valuable one."

I am also aware that the essence, or concentrated extract, has been brought into solids like glue; but this is an operation that cannot be easily effected in climates that are either warm or humid, and in those climates where it can be done, the article is found to be too expensive for common use. I was myself endeavouring to make this glue extract for some friends going to California, when I made my discovery. I had set up a large kettle and evaporating-pan, and after two days labour I reduced 120 pounds of veal to ten pounds of the extract, of a consistence like melted glue and molasses; the weather was warm and rainy, it being the middle of July. I could not dry it either in or out of the house, and unwilling to lose my labour, it occurred to me, after various expedients, to mix the article with good flour and bake it. To my great satisfaction, the bread was found to contain all the primary principles of the meat, and with a better flavour than simple veal soup, thickened with flour in the ordinary method.

This process of mixing and baking I found to be easily and quickly done, and to answer the double purpose of concentrating in the same cake, the nutritious properties of animal and vegetable food, so essential to the healthful sustenance of man. This extract of animal flesh may also be combined with corn, or other vegetable meal, and for some marine purposes, I intend to employ the potato and other anti-scorbutic vegetables having farinaceous qualities, to desiccate the extract.

Nor am I ignorant that portable soups and concentrated meats, preserved in hermetically sealed vessels, have been long known and used, but were very inconvenient to pack and carry, and liable to deteriorate. My meat-biscuit is as convenient and portable as any other hard biscuit. Besides, these liquid soups have the objections before mentioned; they are so drugged with high seasoned condiments, that it is difficult to know of what meats they are made.

From what I have already said of my efforts to make the glue, I feel justified in affirming, that it is difficult of manufacture, if not altogether impracticable (as I have found it), in a moist and warm climate. My invention discloses a process by which, after obtaining the extract, the desiccated soup-bread may be ready for packing away in less than sixty minutes. And the facility and cheapness with which, by proper apparatus and machinery, this bread can be made by my process, will enable not only seafaring men and travellers to use it, but it can be exported for common use to every country where meat is scarce and dear.

I propose, during the ensuing spring and summer, to erect an establishment, and to put up apparatus and machinery, by which I can manufacture twenty beeves, or ten thousand pounds of beef, or other edible meat, per day. I am not able as yet to say how cheap the bread can be manufactured on an extensive scale, and by the aid of these improvements, but I can inform you, that so far as my experiments have gone, I find it, even in the clumsy manner in which I have hitherto manufactured it, much the cheapest and best way of making soup for family use.

With respect to the use and advantages of the meat-bread, I would say, that to the navy and every marine service, it would be invaluable. The health of seamen would be preserved, and their comfort increased by the use of it. Having the quality and flavour of meat fresh from the slaughter, it would doubtless prove anti-scorbutic, and therefore, with the sailors' salt provision, would be of the utmost importance. It can be cooked with great advantage with many other articles of diet; one day a soup with hard biscuit, the next with beans or peas, the third with rice, thus having a fresh article of meat every day.

To travellers on long journeys, through destitute regions, this meat-bread will be of great benefit and of incalculable value.

The geologist or surveyor, with a few ounces of this bread in his pocket, can, with a hunter's cup, make a dish of good palatable and nutritious soup in a few minutes.

For exploring expeditions, and parties of reconnaissance, it would be found very useful. Those persons employed in making geological and mineralogical surveys of our newly acquired territories, as well as those running the boundary, would realize an immense saving of expense and labour by the use of this meat-bread.

It will also be found most convenient and useful for hospitals. A patient can, at shortest notice, have it prepared to any degree of nutrition, from a weak broth to

the most nutritious soup. The absence of grease from the composition, while it possesses the nutritive qualities of the meat, renders it peculiarly adapted for the use of invalids.

For family use, this meat-bread will be found very convenient, and especially so in warm weather, as it requires little fire (or a lamp of alcohol) to prepare it. The various ways in which it can be served up, will be explained in the "directions for cooking," accompanying each package.

You will remember that the combination is simply the extract of meat, with flour or vegetable meal; and to make a palatable soup, it should at least be seasoned with salt and pepper. In judging of the merits of this meat-biscuit, you must not expect to find anything better than can be made with fresh meat and the article with which it is combined; but the great excellence is, that the meat in this form is always fresh, a desideratum not only to the mariner, but to all others.

I have not sold a pound of this meat-bread as yet, and lest a spurious article should be offered, I do not intend to do so, until I am prepared to manufacture it on a larger scale; and I will then only sell through responsible agents. I would here remark, that should I obtain a patent I do not intend to sell rights to manufacture the article, except to the most responsible persons, such as are able to carry it on in a public place on an extensive scale. When the public can witness this meat-bread manufactured of a good article of fat meat, either beef, mutton, pork, or other edible flesh, the importance of this new article of diet will be seen and appreciated; its use become common, and a new avenue for the market of beef, pork, and other meats will be opened. This meat-bread will be manufactured where meats are plenty and cheap, and exported to countries where they are both scarce and dear, thus proving mutually beneficial to the producer and consumer.

This meat-bread should be made of fat and well-conditioned animals, for it is only in such that the nutritive and alimentary properties of meat are contained; besides, it is more profitable, as grease forms no part of the composition of the bread, it will pay much of the expense of the manufacture. In Texas, the hide, tallow, and grease of a fat beef will pay for the animal on foot. From this it may be inferred, that the meat-biscuit can be manufactured at a rate which will justify its use by all who can use meat in any form whatever.

The quality of this meat-bread depends upon the integrity of its manufacture; and to insure this object I have applied, as I have already said, for a patent, and from the favourable opinion expressed of its novelty and utility by Messrs. Munn and Co., as well as by others in this State skilled in the preservation of meats, I have no doubt of obtaining the right to the invention, and thereby be enabled to control and insure the manufacture of a genuine article.

Capt. John G. Tod, believing the discovery a valuable one, and especially for the navy and military corps on detached service, proposes to bring the subject before the government.

If the government will adopt the article as part of a ration for her seamen, say one ounce each per day, I can furnish a genuine article, upon a reasonable notice, and at a rate less than the whisky ration, which I understand is to be abandoned, and some article of diet substituted, and what better than a bowl of good fresh soup?

To advance this object, we have, as stated in the beginning, requested several practical gentlemen to test the article by a careful examination of its qualities and use. For this purpose, likewise, I wish you to forward the parcels herewith accompanying, to such of your friends as will take the trouble to investigate the subject.

Respectfully your obedient servant,

G. BORDEN, JUN.

(To be continued).

SAGO.

According to the London College, Sago is the fecula of the stem (*caudicis fecula*) of "*Sagus laevis Rumph. et alia fortasse Palmarum species.*" The Dublin College, on the other hand, declare it to be "the farina from the interior of the trunk" of the "*Cycas circinalis*," but add that "it is also obtained from other species of *Cycas* and various *Palmaceæ*."

That a starch or farina is obtainable from several species of *Cycas*, is an undoubted fact; but the assertion that the sago of commerce is procured from this source is a gross error. A microscopic examination of the farina obtained from the stems of *Cycas circinalis*, and of other species of *Cycas* cultivated in

this country, will prove that the starch grains of this genus differ both in shape and size from those of commercial sago.

The sago of commerce is undoubtedly the produce of the stems of palms, especially of *Sagus levis*, and the statement of the London College, is, therefore, correct.

PREPARATION OF OILY EMULSIONS.

The preparation of oily emulsions succeeds better, according to Overbeck, if the following proportions of gum be employed:—Different oils conduct themselves differently when rubbed down with gum; castor oil differing most in this respect from the other oils. In order to obtain a perfectly milk-white emulsion of castor oil, two drachms of gum are to be mixed with three drachms of water and one ounce of castor oil, which is to be poured, by a fine stream, into the constantly stirred mucilage. Any additional quantity of water is then readily taken up by the emulsion, which may also be prepared with only four scruples of gum, but without becoming quite white. For other oils half their weight of gum is required, and the quantity of water must be half the total weight of oil and gum. Thus, one ounce of oil of almonds is to be first rubbed down with half an ounce of gum, and six drachms of water are then to be added at once. The so-called crackling [*Kracken*] of the emulsion appears here in a higher degree than after the usual method, and is a favourable symptom of the uniform distribution of the oil in the water.—*Central-Blatt*, 1851, No. vi., p. 75.

ON THE HORNS OF OXEN.

BY FR. HINTERBERGER.

At the suggestion from Liebig, the author examined the horns of oxen, and found that both by sulphuric acid and potash, they yielded leucin and tyrosin. He first repeated the analysis of horn which had been exhausted by alcohol and ether. The material consisted of horn-powder, which, after removing the surface of the horn by filing and washing, was obtained from the deposited parts. The supernatant horn-powder was collected and dried at 100° Cent. After complete incineration, this horn left behind 1.9 per cent. ashes, which consisted of chloride of magnesium, chloride of sodium, phosphate of lime, oxide of iron, and silicic acid. The analysis gave the following results:—

	I.	II.	III.
Carbon.....	50.46	50.83	—
Hydrogen	6.65	6.68	—
Nitrogen	—	—	16.23
Oxygen and sulphur ...	26.66	26.26	—

Diluted sulphuric acid and horn.—Twelve parts of water and four parts of sulphuric acid were boiled with one part of horn filings for three days. The sulphuric acid was saturated by excess of milk of lime, the liquid boiled again for twenty-four hours with the precipitate, the latter pressed, the liquid neutralized by sulphuric acid, then filtered, and a solution of sugar of lead added, till every excess of sulphuric acid was removed. The excess of lead was removed by sulphuretted hydrogen, the liquid boiled with the precipitated sulphuret of lead, and a slightly coloured liquid filtered from it, which, on being evaporated, yielded crystals. These were washed, then boiled in water with a small quantity of potash and carbonate of potash, and the carbonate of lime having been filtered off, the liquid was saturated with acetic acid, and the solution allowed to become cold. The crystals of tyrosin were purified by solution in water and spontaneous evaporation, by the aid of charcoal. When air-dry, they form a coherent mass with a silk-like lustre, consisting of long, conglomerated needles, which are themselves composed of small needles grouped in the form of stars. They burn on platina foil without leaving a residue, but emitting a smell of burnt hair; they are soluble in ether or absolute alcohol, with great difficulty only in cold water, rather readily in boiling water, and very readily in alkalies and mineral acids. From a solution in ammonia, they reappear, upon the spontaneous evaporation of the latter unaltered, but in a larger form. The crystals of tyrosin from horn possess the same properties as the tyrosin obtained by Liebig from casein, and by Bopp from fibrin and albumen; they were dried at 100° and analyzed, and the results agree perfectly with those obtained by Warren de la Rue in the analysis of the tyrosin from cochineal and lead, consequently also to the formula $C_{15}H_{11}NO_4$.

Carbon	59.36.....	18 = 108.....	59.67
Hydrogen	6.34.....	11 = 11.....	6.08
Nitrogen.....	7.88.....	1 = 14.....	7.73
Oxygen	26.52.....	6 = 48.....	26.52
	100.00	181	100.00

The leucin was discovered in the mother liquor of the tyrosin, when the above described operation was so far altered, that the sulphuric liquid, after having been saturated by excess of lime, was not treated with a lead salt. The excess of lime having been precipitated by sulphuric acid, the slightly acid liquid was evaporated, the crystals of tyrosin, which first presented themselves in a globular form, removed, and the mother liquor further evaporated. The crystals which now appeared, consisted almost entirely of leucin, but were not white. They were dissolved in water, mixed with hydrated oxide of lead, the excess of lead in the filtered liquid removed by sulphuretted hydrogen, and the liquid evaporated. The leucin was now free from tyrosin, and could be obtained perfectly white by recrystallization from water, application of animal charcoal, and repeated recrystallization. It consisted of pearly laminae, which were readily deposited in a concentric manner, were volatilized when slightly heated in a glass tube, and floated about in the air as flocculi, like oxide of zinc. By these properties, as also by its great solubility in water, acids and alkalies, the leucin can easily be recognised.

Albumen, fibrin, and casein yield by a similar treatment much leucin, but less tyrosin; in horn the proportion is reversed. The quantity of both substances, however, increases to a certain point by this treatment of horn, in proportion to the time it is boiled with sulphuric acid, perhaps also by the longer action of the milk of lime upon the sulphuric solution of horn; for, if horn be boiled only for one day with sulphuric acid, and the milk of lime be allowed to operate only as long as ammonia could be discovered by the smell, small quantities only were obtained. At 107° Cent., the mixture of sulphuric acid and water first begins to boil. The boiling proceeds very steadily, when a few pieces of charcoal are put into the boiling liquid, and when, after the horn has been boiling for one day with sulphuric acid, the supernatant liquid be poured off from the sand and gypsum (which are deposited during the night at the bottom of the retort) into another vessel. After three days boiling, the liquid is light-brown; if then excess of fresh prepared milk of lime be added, a large quantity of ammonia is developed, the presence of which can, even after two days additional boiling, be shown by a glass rod moistened with muriatic acid.

Hydrate of potash and horn.—Horn chips were melted in a large iron pot, with an equal weight of hydrate of potash, until, besides ammonia, hydrogen was also developed, and the fused mass, at first brown, had become somewhat paler. This was dissolved in boiling water, acetic acid added till a slight acid reaction took place, and the liquid filtered and evaporated so as to yield crystals. After twelve hours, a rather large quantity of crystals of tyrosin and some of leucin had formed, which were separated as stated above.

When the alkaline mass is saturated with sulphuric acid instead of with acetic acid, a distilled liquid of a very disagreeable smell is obtained, which contains also butyric acid and valerianic acid.—*Ann. der Chem. und Pharm.*, and *Pharm. Central Blatt*, 1850, No. 14.

ADULTERATION OF CANTHARIDES WITH CHRYSOMELA FATUOSA.

EMMEL detected fifteen per cent. of *Chrysomela fatuosa* in cantharides obtained from a commercial house, and he has no doubt that it was intentional.—*Central-Blatt*, 1851, No. vi., p. 96.

ADULTERATION OF THE OILS OF LAVENDER AND CASSIA.

DR. HARTUNG SCHWARZKOPF obtained from a commercial house, which he does not in the least suspect of participating in the fraud, the oils of lavender and cassia, as being of the finest quality; the first of which does not at all possess the pure, agreeable perfume, but an accessory odour of turpentine and rosemary. This odour became more distinct when the oil was poured upon a cloth and moved about in the air, or when it was heated in a spoon. Iodine gave no trustworthy indications; but the adulteration with oil of turpentine was readily discovered when the oil was shaken with three times its quantity of alcohol of 0.83 p. weight, which was incapable of dissolving the oil. The presence of oil of rosemary could not be dis-

covered by this test, since this oil dissolves in alcohol of the above strength. The oil of cassia possessed the pure odour of cassia, but was suspicious by its great liquidity. The usual tests for adulteration with spirit of wine gave no satisfactory results. Upon mixing the oil with water it did not become opaque, and a drop of the oil being allowed to fall into a glass filled with water produced no opaque streak. Perfectly dry chloride of calcium being thrown into the oil, dissolved, and formed under the oil a liquid layer, which satisfactorily proved the presence of spirit of wine.—*Central-Blatt*, 1851, No. iv., p. 62.

BLEACHING OF IVORY BY SULPHUROUS ACID.

IVORY knife-handles, which have become quite yellow from use, being left for from two to four hours in a watery solution of sulphurous acid, become white again. The acid in the gaseous form makes the ivory crack.—*Central-Blatt*, 1851, No. v., p. 80.

ON THE COMBINATIONS OF SUGAR WITH LIME.

BY M. E. PELIGOT.

It has long been known that slacked lime is dissolved in large quantity by an aqueous solution of sugar. I have shown in a memoir which I published in 1838, "On the Nature and Properties of Sugars," that the addition of alcohol produces in the calcareous liquid containing an excess of sugar, a white precipitate, which, on being dried, is transformed into a brittle resiniform mass. This body, although not crystalline, presents always the same composition. It contains fourteen per cent. of lime, which corresponds with the crystallized compound of sugar and baryta. Its composition is represented by the formula $C_{12} H_{11} O_{11}, Ca O$.

This compound is very soluble in water. Its solution, as well as that obtained by the contact of solution of sugar with lime in great excess, in which case the latter is dissolved in much greater quantity, possesses the property of becoming turbid when heated, and even of being entirely coagulated, like the albumen of egg, when reduced to a suitable state of concentration. But, unlike coagulated albumen, the calcareous precipitate disappears again as the temperature is reduced, and the liquid becomes perfectly limpid and transparent even before it has entirely cooled.

I have renewed the investigation of this curious phenomenon, and have ascertained that the compound of sugar and lime, which is thus precipitated by the action of heat, has not the composition nor the properties of that or of those in solution in the liquid. I succeeded in readily isolating the first of these bodies, by separating it, by filtration, from the liquor kept at the boiling temperature.

The analysis of this body, after being well washed and dried without contact with the carbonic acid of the air, led to the following formula, $C_{12} H_{11} O_{11}, 3 Ca O$. It contained 32.9 per cent. of lime.

Cold water left in contact with an excess of this substance, dissolved less than one per cent. of its weight. On heating this saturated solution, it becomes turbid, and half of the lime and sugar compound which it contained is precipitated, so that it requires 200 parts of boiling water for the solution of one part of this compound. It is, therefore, less soluble than the compound of sugar and baryta. In fact, I have found that 100 parts of water dissolves 2.1 parts of this latter compound at 60° Fahr., and 2.3 parts at 212° Fahr.

It is easy to explain the circumstances under which this body is formed. When a solution of sugar saturated with lime is submitted to the action of heat, so as to produce an abundant precipitate from the boiling liquor, this precipitate contains in a free state, a portion of the sugar which was present with the lime when cold. As the liquid is allowed to cool, the free sugar again combines with the lime which was precipitated in the form of a tribasic compound, and thus again disappears as the cooling proceeds. Indeed, this salt, which is almost insoluble in pure water, is on the contrary very soluble in saccharine water.

The quantity of lime which is dissolved in a portion of saccharine liquid, varies in accordance with the density of the liquid. This result does not agree with one of the results given by M. Soubeiran in the notice on the *Combinations of Cane-sugar with the bases*, which he published in 1842. According to this Chemist there exists a compound represented by the formula $2 C_{12} H_{11} O_{11}, 3 Ca O$, which M. Soubeiran designates by the name of Tricalcic Sugar (*sucres tricalciques*). This body, which contains twenty per cent. of lime, is obtained, says M. Soubeiran, whenever the lime is

in excess in relation to the sugar. It is, he adds, the compound of sugar and lime, which is formed most readily.

After frequent and carefully conducted experiments I have determined the proportions of lime dissolved in pure saccharine water taken at different densities. In order to obtain certain results we must, in the first place, use in a very great excess well powdered lime (at least double the quantity to be dissolved); 2ndly, The lime must be introduced in very small quantities into the liquid, which becomes heated by the combination, and which dissolves with difficulty, even with frequent agitation, the latter portions of the base which it takes up.

The following table shows, 1. The composition and the density of the saccharine liquor; 2. Its density after having been saturated with lime; 3. The quantities of lime and of sugar contained in 100 parts of residue yielded by evaporation to dryness of each of these solutions. This residue was dried at 248° F. The densities were taken with the utmost accuracy by means of a specific gravity bottle:—

Sugar in 100 Parts Water.	Density of Saccharine Solution.	Density of Liquid when saturated with Lime.	100 Parts of the Dry Residue contain	
			Of Lime.	Of Sugar.
40.	1.122	1.179	21.	79.
37.5	1.116	1.175	20.8	79.2
35.0	1.110	1.166	20.5	79.5
32.5	1.103	1.159	20.3	79.7
30.0	1.096	1.148	20.1	79.9
27.5	1.089	1.139	19.9	80.1
25.0	1.082	1.128	19.8	80.2
22.5	1.075	1.116	19.3	80.7
20.0	1.068	1.104	18.8	81.2
17.5	1.060	1.092	18.7	81.3
15.0	1.052	1.080	18.5	81.5
12.5	1.044	1.067	18.3	81.7
10.0	1.036	1.053	18.1	81.9
7.5	1.027	1.040	16.9	83.1
5.0	1.018	1.026	15.3	84.7
2.5	1.009	1.014	13.8	86.2

On looking over the numbers contained in this table it will be seen that Soubeiran's statement is incorrect; the constant formation of a compound having the composition $2\text{C}_{12}\text{H}_{11}\text{O}_{11}$, 3CaO , resulting from the action of a solution of sugar on lime in excess, cannot be admitted. A substance is formed, certainly, in which the sugar and the lime are in the proportions observed by Soubeiran, when the lime is left in contact with the saccharine liquid containing about a fifth of its weight of sugar. But this result is accidental, and does not in any way indicate the production of a definite compound, for this product, which is uncrystallizable, does not differ, in its mode of formation and its properties, from those which are formed under similar conditions with solutions either less dense or more highly charged with sugar. The product differs in its composition with every change of density in the solution with which it is produced.

In fact, the existence of several definite compounds of sugar and lime can no longer be doubted. We must admit that the compound having the composition $\text{C}_{12}\text{H}_{11}\text{O}_{11}$, CaO , is the only one soluble in water which is directly formed at the moment of contact of the solution of sugar and lime. This body, when once formed, dissolves a fresh quantity of the base, which increases in proportion to the density of the saccharine solution. The influence of mass contributes to this result, for when the water is in a certain proportion in relation to the sugar, there are present the solvent power existing between these two bodies, and the force of cohesion in the solid lime, and, the sugar acting as a very feeble acid, these two forces are opposed to each other. In proportion as the solvent is in smaller quantity in relation to the body dissolved, the force of cohesion is overcome by the affinity which promotes the combination of the sugar with a greater quantity of base, so that the quantity of lime dissolved increases with the increased density of the saccharine liquid. It may be admitted, I think, that the compound, to the production of which there is a tendency under these circumstances, has the formula $\text{C}_{12}\text{H}_{11}\text{O}_{11}$, 2CaO , which corresponds with the compound of sugar and oxide of lead; it would contain 24.6 per cent. of

lime. But the existence of this body is only probable, for when we attempt to saturate a saccharine liquid, containing about thirty per cent. of sugar, with lime, the calcareous solution becomes very viscous, and after a certain time sets into a mass. Moreover, a precipitate, consisting of a solid calcareous compound, but little or not at all soluble, is immediately formed when lime is added to a syrup of 35° Beaumé. In either case the product obtained is mixed with an excess of lime, which it appears to me it is impossible to separate.

The preceding observations have led to the adoption of a process by means of which the sugar, which exists in large quantity in molasses, may be extracted. I have thus obtained 25 per cent. of crystallizable sugar from common molasses by the mere use of lime and carbonic or sulphuric acid. This quantity, which, however, may be increased, is, it is true, less than that which M. Dubrunfaut extracts by precipitating the sugar in combination with baryta, which I made known about twelve years ago; but the low price of lime, and its undoubted innocuity, together with other points which might be adduced, give, I think, some interest to the experiments which have led to this result.—*Journal de Pharmacie*.

ON THE SOLUTION OF CARBONATE OF LIME IN THE SACCHARATES.

BY M. BARRESWILL.

THE interest which attaches to subjects relating to the manufacture of sugar has induced me to make known a fact which I should otherwise have reserved for publication with other parts of the investigation with which it is connected. It is already known to scientific men that molasses, at least that of the beet-root, does not contain uncrystallizable sugar, properly so called, and that it is composed of crystallizable sugar, of organic substances differing from sugar and of salts, and that the sugar which is prevented from crystallizing by the presence of these foreign substances, may be easily separated, wholly or in part from the mixture, either by oxide of lead, which precipitates certain foreign substances and leaves the sugar in a great state of purity, or by baryta which precipitates the sugar and leaves the foreign substances in solution. Both these processes, the one that of Dr. Scoffern, the other that of M. Dubrunfaut, have been tried on the large scale, the former having been principally applied to cane sugar, and the latter to beet-root sugar, and the results may be considered to have set the problem at rest. The only serious objection which can be raised against them has reference to the poisonous nature of the two reagents, and it is desirable, while the subject continues to engross attention, that Chemists should pursue investigations with the view of obviating the evils which have been anticipated from the use of lead and baryta, or of discovering other agents the use of which would be unobjectionable. M. Péligot has been engaged in this inquiry, and the notes which he has published on the compounds of sugar and lime, offer some useful suggestions. I have thought that a careful study of the composition of molasses would further this investigation, and the fact which I have now to make known appeared to possess some interest in connexion with the inquiry.

I have observed that the alkaline molasses of beet-root generally effervesce with acids, even after they have been boiled. I have collected the disengaged gas, and have proved it to be carbonic acid. I was surprised at this result, considering, as is well known, that the molasses contain salts of lime, the presence of which appeared to be incompatible with that of the bicarbonates. I could admit but one explanation of the result, namely, that carbonate of lime is certainly soluble in water, or at least in one of the impurities of the molasses of the beet-root.

I was, therefore, induced to place in the presence of carbonate of lime, either ready formed or in the nascent state, the different substances, the existence of which have been indicated by Chemists who have analyzed molasses.

These experiments have led to the discovery that carbonate of lime is soluble in the compound of sugar and lime, as may be proved in different ways.

Thus, a solution of the compound of sugar and lime through which carbonic acid is passed does not immediately become turbid. Chloride of calcium and carbonate of soda, when added to a solution of the lime and sugar compound does not cause a precipitate; but a solution of sal ammoniac added to a solution of carbonate of lime in the saccharate causes an immediate precipitate of pure carbonate of lime. The sal ammoniac is used to saturate the free lime of the saccharate. It need hardly be said that this reagent must be added with care, as it is, itself, a solvent of the carbonate. This fact of the solubility of carbonate of lime in the saccharate indicates the formation of a double salt. I have obtained evidence that such a double salt exists, and that it may be isolated, but I have not yet obtained it unmixed with

the saccharate. I will pursue this investigation, considering the production of these double salts, which the compounds of sugar with the earths are capable of so easily forming, a circumstance of considerable importance in connexion with the subject of the extraction of sugars.

The fact of the solubility of carbonate of lime in the compounds of sugar and lime is also of importance in connexion with the analysis of sugars, and even in a physiological point of view as indicating the mode of formation of some of the products of the organism.—*Journal de Pharmacie*.

ON THE MANUFACTURE OF FACTITIOUS SALTPETRE FOR COMMERCIAL PURPOSES.

Mr. ROTCH has patented the following method of manufacturing saltpetre : Into any suitable round-bottomed iron boiler, 2000 pounds of *caustic* American potashes (the red potash of commerce) are dissolved in 1000 quarts of water, and heat applied for three hours, at the expiration of which, the potash solution should have a density of 45° Beaumé (sp. gr. 1.453) ; in a similar boiler, 1,300 pounds of nitrate of soda are dissolved in 1,200 quarts of water, applying heat as in the former case, until this solution has also acquired the specific gravity above mentioned. Both solutions are then allowed to cool and settle, after which they are again heated to from 175° to 200° Fah., and then poured into a third vessel forming the crystallizing pan : double decomposition takes place, and crystals of nitrate of potash are deposited, the first crop of which furnish 700 to 900 pounds of good commercial saltpetre. Care must be taken not to let the heat fall below 85°, the temperature at which the crystals form ; and the more regularly the heat is maintained, the speedier will be the deposit of the crystals.

By this means, it is stated, that a nitre is produced, equal to the best Bengal saltpetre, after the latter has undergone the process of refining.

ON THE MANUFACTURE OF SULPHATE AND BISULPHATE OF POTASH.

IN the February number of the *Journal*, we spoke of the impure sulphate of potash, as a bye product obtained in the manufacture of tartaric acid. By dissolving this impure sulphate in water, digesting with animal charcoal and re-crystallizing, a pure sulphate of potash may be obtained.

The bisulphate of potash may be also obtained in the same way, but instead of adding to the sulphate of potash one equivalent of sulphuric acid, it will be found in practice advantageous to add two equivalents, in order to obtain fine crystals of bisulphate.

In both these cases, care must be taken to avoid the use of the double salt of sulphate of potash and lime, found by Mr. Phillips as an incrustation on the boiler in which the impure sulphate of potash solution is concentrated, and which is sometimes mixed with the sulphate of potash sold.

ON BEBEERINE.

BY M. A. DE PLANTA.

AN organic base has been known in commerce for some time past, which was obtained in 1834 by M. Rodie, from the bark of a tree called Bebeeru, in the colony of Demerara, and which has been subsequently described under the name of *Nectandra Rodiei*, by Sir Robert Schomburgh.

To prepare the bebeerine in a state of purity the author first followed the process described by Dr. MacLagan. The impure sulphate of commerce was dissolved in water, and bebeerine precipitated by ammonia. After having washed it, it was mixed with hydrate of lead, and the mixture evaporated in a water-bath. The dry residue yields to ether impure bebeerine, which is obtained by evaporation of the ethereal solution in the form of a brownish, resinous mass. In order to purify this product, M. Planta treats it with acetic acid, which imperfectly dissolves it ; to the filtered liquor he adds an excess of acetate of lead, and then potash, until a precipitate is formed. The combination of bebeerine and oxide of lead, which is thus obtained, is dried in a water-bath, and exhausted with ether. On distilling away the ether, the bebeerine is left in the form of a syrupy mass, having a slightly yellow colour. It is dissolved in absolute alcohol, and the solution, in a concentrated state,

added drop by drop, to cold water kept constantly agitated. It forms a thick precipitate, which may be collected on a filter, washed and dried without agglutinating.

When thus prepared, bebeerine is a colourless powder, free from smell, unalterable in the air, highly electric, and, when ignited on platinum foil, leaving a carbonaceous residue, which completely burns away. It melts at 356° Fah., and on cooling becomes a vitreous mass. Above 356° Fah. it decomposes without volatilizing. It has a strong alkaline reaction, and completely neutralizes the acids, forming uncrystallizable salts. It is very slightly soluble in water, but dissolves more easily in ether, and in all proportions in alcohol.

The following are some of the reactions of hydrochlorate of bebeerine. Potash, ammonia, and the carbonates of these alkalis, separate the bebeerine in the form of white mucilaginous flakes, but slightly soluble in excess of the precipitant. Bicarbonate and phosphate of soda form white precipitates, chloride of gold a reddish brown precipitate, and chloride of platinum a yellowish white precipitate. Corrosive sublimate, iodide of potassium, sulphocyanide of potassium, and tincture or infusion of nutgalls, give white precipitates. Tincture of iodine gives a Kermes brown, and picric acid a sulphur-yellow precipitate. Iodic acid colours the solution of the hydrochlorate first pure red, then reddish brown, and finally deep red.

According to the analyses of M. de Planta, the composition of bebeerine may be represented by the formula $C_{28}H_{21}NO_6$. It is not, therefore, isomeric with morphine ($C_{24}H_{19}NO_6$), as was thought by MacLagan and Tilley. When a concentrated solution of hydrochlorate of bebeerine is added, drop by drop, to a weak solution of chloride of platinum, an orange yellow amorphous precipitate is obtained, which has the composition $C_{28}H_{21}NO_6 + HCl$, $PtCl_2$.—*Journal de Pharmacie*.

ON THE USE OF HYDROFLUOSILICIC ACID IN ANALYSIS.

BY PROFESSOR M. ROSE.

HYDROFLUOSILICIC acid is often used, as is well known, in analysis, especially for the separation of potash from acids with which it may be combined, such as hydrochloric, perchloric, and chromic acids.

In quantitative analysis, however, it has not been thought to be available, because, although the fluosilicate of potash is but little soluble in water, it is sufficiently so to render the estimation of potash by this means inexact.

Professor Rose has found that the fluosilicate of potash is wholly insoluble in water mixed with alcohol. If, therefore, a solution of a salt of potash be mixed with an excess of hydrofluosilic acid, and then with an equal volume of strong alcohol, the whole of the potash is precipitated in the state of fluosilicate of potash, which may be washed with a mixture of alcohol and water.

It is also known that Berzelius has proposed the use of hydrofluosilicic acid for the qualitative and quantitative separation of baryta from strontia, and this is, perhaps, the best method known, although fluosilicate of baryta is not completely insoluble in water. Professor Rose finds that in effecting the precipitation in an alcoholic liquor, the result is quite certain, and that the baryta may thus be completely separated, and its estimation determined with absolute accuracy.—*Journal de Pharmacie*.

ON THE COLOURING MATTERS OF FUSTIC (*Maclura tinctoria*).

BY R. WAGNER.

THE wood of *Morus tinctoria*, Jacq.; *Broussonetia tinctoria*, Kunth [*Maclura tinctoria*, Nutt.] known in commerce by the name of *Fustic*, has been examined by Chevreul, George, and also by Preisser. The first found in it two colouring matters, which dyed materials treated with alum, yellow; and which he called white and yellow *morin*. George gives a superficial analysis of the wood, stating that fustic contains 15 per cent. of substances soluble in hot water, consisting of gum, tannic acid, colouring matter, and gallic acid. The statements of Preisser respecting this dyewood, as well as other colouring matters, have been contradicted by Arpe, Elsner, and many others.

Wagner submitted fustic to careful examination, and has arrived at the following conclusions respecting it:—

1. It contains two yellow colouring principles, one which he calls *morin*, the other *morintannic acid*. The former exists in the wood in combination with lime.

2. These two substances are isomeric, and have the formula $C_{15}H_5O_4$.

3. *Morin* (moric acid) behaves towards bases as a weak acid, enters into combination with them, and has in the compounds thus formed the formula $C_{15}H_5O_7$.

4. *Morintannic acid* is quercitannic acid, a tribasic acid, and its composition is expressed by the formula $C_{18}H_8O_7 + 3HO$.

5. In composition morintannic acid is intermediate between quercitannic acid, $C_{18}H_8O_{12}$, and catechu-tannic acid, $C_{18}H_8O_8$.

6. *Morintannic acid* is the first known crystallizable tannic acid, and is distinguished from all the other tannic acids hitherto examined by its composition, and by its behaviour towards the salts of the sesquioxide of iron, emetic-tartar, and the salts of lead.

USES OF THE NITRO-MURIATIC ACID BATH.

BY RANALD MARTIN, ESQ.

MR. MARTIN, in some valuable papers on tropical diseases, gives the following directions for the preparation and use of the acid bath :—

Take of hydrochloric acid, three parts; nitric acid, two parts; distilled water, five parts, mix carefully.

1. Of this dilute nitro-muriatic acid, three ounces by measure are to be added to each gallon of water, to form the bath.

2. Two gallons of water may suffice for an ordinary foot-bath.

3. The bath thus prepared will keep in use for a week, by adding to it, once every day, half an ounce of the dilute acid and a pint of water, in order to make up for waste in evaporation.

4. A portion only of the bath is to be heated for use, after which it is to be added to the remainder, so as to make the whole of from 96° to 98° .

5. Let both feet be placed in the bath, while the inside of the legs and thighs, the right side over the liver, and the inside of both arms, are sponged alternately; or let the abdomen be swathed in flannel soaked in the bath. This should be continued for fifteen minutes, morning and evening.

6. While using the bath, a gentle aperient, as Cheltenham or Epsom salts, in some bitter infusion, should be taken every other morning; and, should there be dryness or harshness of the skin, a warm-vapour bath, used twice a week, will be found of much service in stimulating and opening the pores, and in purifying the surface of the body.

7. In urgent cases, a general bath to envelope the whole body should be used, the proportions of the dilute acid and water being continued as above stated.

8. Earthen or wooden vessels should be used for the baths, and the sponges and towels kept in cold water, lest the acid corrode them.

9. The acid mixture forming the bath should be heated in earthenware vessels—large pipkins for instance. When used, the temperature should be measured by the thermometer, at 96° and 98° , as the body will be chilled by a degree of warmth that feels comfortable to the hand.

10. When a general bath is used for the whole body, the patient before going into the bath, should be covered over with blankets, until a gentle perspiration is induced.

11. When in the bath, a covering blanket should be drawn over the shoulders, and up to the chin, to confine the steam, and a nightcap should be worn to protect the head from the steam.

12. Before quitting the bath, the bed, drawers, and towels should be warmed and ready; the body to be dried while standing in the bath, and the dressing to be performed immediately.

13. When the acid bath excites much irritation of the skin, the quantity of dilute nitro-muriatic acid may be diminished; and when irritation of the gums, with general *malaise*, occurs, the use of the bath should be relinquished for a time, resuming its application, if necessary, when the above symptoms have subsided.

Mr. Martin states that a course of two months of this bath is found generally to restore the healthy action of the liver; nor does it interfere with the use of bitter tonics, or even with mild chalybeates, but, on the contrary, it rather gives effect to their operations. In the severer instances he has continually to use this means for a much longer period. In treating torpor of the liver, he recommends warm and tepid baths, and especially those of sea water, in aid of other medical treatment, reducing the temperature as the patient approaches health, and after the cessation of other means of cure.

The neglect of the nitro-muriatic acid treatment in cases of the nature here treated of, and in which mercury, in every form, proves not only insufficient but pernicious, is much to be regretted.

A valuable quality of the nitro-muriatic acid is, that whether exhibited internally or externally, its influence in promoting the secretions is not in the least degree counteracted by opium, even when exhibited in the largest doses. We obtain, in

short, from the use of the mineral acids in the treatment of chronic disease, all the remedial aids which can be obtained from mercury in the treatment of acute disease; and that, without any of the injurious consequences that so frequently ensue from the exhibition of the last named agent. Persons of anæmic or of scrofulous habit are liable to serious injury from the use of mercury, whether given in large doses during a few days, or in alternative doses during weeks or months. It is quite otherwise in respect to the acids, the most marked and lasting improvement of the general health being the ordinary result of their exhibition.—*Prov. Med. Jour.*

ON THE COMPOSITION OF THE BITTER PRINCIPLE OF ARTEMISIA ABSINTHIUM.

BY DR. E. LUCK.

MEIN and Righini have described methods more or less tedious for preparing pure absinthine. The former Chemist states that he obtained it crystalline and white.* To obtain this substance, I proceeded in the following manner:—The dry herb was exhausted with alcohol of 0.863, and the clear liquid distilled to the consistence of a syrup, the residue transferred into a stoppered bottle, and well shaken with æther. After some time this separates with a yellowish-brown colour. This treatment with æther is repeated until it no longer has a very bitter taste. The æthereal liquid is distilled in the water-bath; the residue consists of a viscid mixture of a blackish-brown acid resin and absinthine. On treating it with water, to which a few drops of ammonia have been added, the black smeary resin is principally taken up, and the greater portion of the absinthine left behind.

In proportion as it becomes purer it acquires a pulverulent form. On adding a further quantity of ammonia, absinthine is also dissolved; but on triturating with concentrated ammonia, far less passes into solution, because the compound of ammonia with absinthine is very sparingly soluble in ammonia.

To remove the ammonia, it is now digested with dilute hydrochloric acid, then washed with water, dissolved in alcohol, and solution of acetate of lead mixed with it as long as any turbidity results, filtered, and sulphuretted hydrogen passed into the liquid, in order to decompose the excess of the lead salt. The alcoholic solution filtered from the sulphuret of lead is mixed with a small quantity of water, allowed to evaporate slowly in a warm place, when the absinthine separates in yellow resinous drops. These are soft, become coated when mixed with water with an opaque membrane, and in the course of some weeks all the drops become converted into hard masses, which externally are jagged and rough, internally, radiate and indistinctly crystalline.

The colour is brownish-yellow to yellow; when pulverized, it furnishes a yellowish powder, of a faint, disagreeable, bitter odour of wormwood; it has an intensely bitter taste, is sparingly soluble in water, and melts in boiling water. It dissolves readily in alcohol, somewhat less in æther, and is likewise soluble in concentrated acetic acid, from which it is partially precipitated by water. It has a tolerably acid reaction, and dissolves, as above stated, somewhat in an aqueous solution of ammonia, but far more readily in caustic potash, with a golden-yellow colour. Cold sulphuric acid dissolves it as first with a reddish-yellow colour, which however quickly turns indigo-blue by exposure to the air, apparently with absorption of oxygen. Water produces in this blue solution a dirty gray-green flocculent precipitate, and the supernatant liquid is of a rose colour. After the flakes have been washed on the filter with water, they dissolve readily in alcohol with a yellow colour, but sparingly in æther. This substance has no longer a bitter taste; and its spirituous solution leaves on evaporation a violet-blue amorphous residue, which again dissolves with a yellow colour.

Hydrochloric acid dissolves absinthine with a yellow colour, which on the application of a gentle heat passes into red; subsequently the colour becomes darker, with a turbidity and separation of a brown mass; it dissolves in fuming sulphuric acid with a brown colour. Heated upon platinum foil, it is partially volatilized in brownish-yellow bitter vapours, which condense into an amorphous substance, but the greater portion is carbonized. The substance, dried *in vacuo* over sulphuric acid, gave the following analytical results:

Carbon	65.06	...	65.30	...	16	=	96	...	65.30
Hydrogen	7.60	...	7.65	...	11		11	...	7.48
Oxygen	—	...	—	...	5		40	...	27.22

The empirical formula for absinthine is therefore $C_{16}H_{11}O_5$, the rational formula

* See Dr. Zwenger's observations on this subject in *Chem. Gaz.*, vol. ii., p. 124.

probably $C_{16}H_{10}O_4 + HO$. The preparation of a pure compound of absinthine with a metallic oxide of constant composition is exceedingly difficult.

Absinthine was dissolved in alcohol and mixed with some caustic potash, carbonic acid passed into the dark golden liquid as long as carbonate of potash separated, and then some æther added and filtered. In this solution of absinthine and potash acetate of lead produced a beautiful yellow flocculent precipitate of absinthine and oxide of lead; but in the course of a few minutes it was converted into heavy white oxide of lead, and the alcohol became coloured yellow by dissolved absinthine. It was also found impossible to obtain the potash compound in a solid form. The spirituous solution of the bitter principle gives no precipitate with neutral acetate of lead, and but a slight turbidity with basic acetate of lead; I succeeded, however, in obtaining a lead compound in the following manner:—Basic acetate of lead and some ammonia were added to an alcoholic solution, and evaporated to dryness in *vacuo* over sulphuric acid. The dry residue was rubbed to powder, and treated first with water, and after drying with æther as long as any thing was dissolved, and lastly alcohol was employed for washing. This compound gave 55.25 per cent. oxide of lead, leading to the formula $2(C_{16}H_{10}O_4) + 3PbO$, which requires 54.80 oxide of lead.—*Liebig's Annalen*, April, 1851.

POISONOUS PROPERTIES OF HOMERIA COLLINA.

(Nat. Ord. *Iridæ*.)

Homeria collina, Sweet. Root a corm or tuberous bulb, covered with a fibrous, reticulated, hardened coat. Shaft erect, smooth, paniculately branched. Branches 2-3 flowered. Spathe 2-valved, awned. Radical leaf strap-shaped, narrow, caudate, concave, abruptly pointed, outreaching the shaft. Cauline leaves 2-3 much smaller. Corolla ephemorous, of a yellow or vermilion colour.

I introduce this plant (which is known to almost every child in the colony as the *Cape Tulip*) not for its therapeutical use, but for its obnoxiousness. The poisonous qualities of its bulbs appear to have been known to some extent years ago, but, judging from the rapidity with which death ensued in a recent case, when they had been eaten by mistake, it must be of a very poisonous kind. To Doctor Laing, Police Surgeon of Cape Town, I am indebted for the particulars of a most melancholy case of poisoning, caused by this bulb.

A Malay Woman, somewhat advanced in years, with her three grand-children, respectively of the ages of 12, 8, and 6, partook, on the 18th September last (1850) of a supper, consisting of coffee, fish, and rice, and ate along with this, a small basinful of the bulbs of the *Homeria collina*. The exact quantity which each ate, is not well known. They appear to have supped between 7 and 8, and retired to bed at 9 o'clock, apparently in good health.

About one in the morning, the old woman awoke, with severe nausea, followed by vomiting, and found the children similarly affected. She endeavoured to call for assistance, but found herself too weak to leave her bed; and when, at five o'clock assistance arrived, the eldest girl was found *moribund*, and expired almost immediately. The little boy of eight years died an hour afterwards, and the youngest child was found in a state of collapse, almost insensible, with cold extremities, pulse scarcely 50 and irregular, pupils much dilated. The symptoms of the grandmother were nearly similar, but in a lesser degree, accompanied by constant efforts at vomiting. By using diffusable stimulants, she and this child eventually recovered.

The body of the eldest child was examined twelve hours after death. Marks of intense gastritis were found, particularly about the cardiac and pyloric orifices. The inflammation extended throughout the whole course of the small intestines, and there was great venous congestion of the brain.

It is remarkable, that in cases of poisoning from *Fungi*, violent diarrhœa is present along with vomiting, whereas, in the present case, obstinate constipation prevailed.

Most probably, all plants belonging to this genus partake of this poisonous property, which, in the case mentioned above, was not dissipated by boiling.—*Flora Capensis Medicæ Prodrômus*, by L. Pappe, M.D.

PORCELAIN BATHS AND STEAM TUBS.

Introduced by Messrs. Rufford and Finch (*Stourbridge*).

The superiority of porcelain over other materials usually employed for the construction of baths, consists in the nature of the surface, the cleanliness, and the light appearance. It is preferable to marble on account of not absorbing so much heat. The joins in the porcelain baths have always been an objection, which it was

desirable to overcome, and many attempts have been made to construct baths in one piece. Much difficulty was found in accomplishing this object on account of the tendency of the bath, from its size and weight, to lose its shape during the process of drying, and to crack when heated in the kiln. Messrs. Rufford and Finch have lately succeeded in attaining the desired result, for which a medal was awarded by the Society of Arts. The first specimen of this description of bath was fixed in the St. Marylebone baths and washhouses, above twelve months ago, since which time further improvements have been made in the material and construction, and a very superior bath is now in the Crystal Palace, on the north-west division. Steam-tubs, wash-tubs, and other vessels of various forms, are also constructed of the same material. Some of these might be usefully employed for maceration and other pharmaceutical purposes.

AN ACT TO REGULATE THE SALE OF ARSENIC.—5th June, 1851.

WHEREAS the unrestricted sale of Arsenic facilitates the commission of crime : be it enacted by the Queen's most Excellent Majesty, by and with the Advice and Consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. Every person who shall sell any Arsenic shall forthwith, and before the delivery of such Arsenic to the purchaser, enter or cause to be entered in a fair and regular manner, in a book * or books to be kept by such person for that purpose, in the form set forth in the Schedule to this Act, or to the like effect, a statement of such sale, with the quantity of Arsenic so sold, and the purpose for which such Arsenic is required or stated to be required, and the day of the month and year of the sale, and the name, place of abode, and condition or occupation of the purchaser, into all which circumstances the person selling such arsenic is hereby required and authorized to inquire of the purchaser before the delivery to such purchaser of the Arsenic sold, and such entries shall in every case be signed by the person making the same, and shall also be signed by the purchaser, unless such purchaser profess to be unable to write (in which case the person making the entries hereby required, shall add to the particulars to be entered in relation to such sale, the words "cannot write"), and, where a witness is hereby required to the sale, shall also be signed by such witness, together with his place of abode.

2. No person shall sell Arsenic to any person who is unknown to the person selling such Arsenic, unless the sale be made in the presence of a witness who is known to the person selling the Arsenic, and to whom the purchaser is known, and who signs his name, together with his place of abode, to such entries, before the delivery of the Arsenic to the purchaser, and no person shall sell Arsenic to any person other than a person of full age.

3. No person shall sell any Arsenic unless the same be before the sale thereof mixed with soot or indigo in the proportion of one ounce of soot or half an ounce of indigo at the least to one pound of the Arsenic, and so in proportion for any greater or less quantity : Provided always, that where such Arsenic is stated by the purchaser to be required, not for use in agriculture, but for some other purpose for which such admixture would, according to the representation of the purchaser, render it unfit, such Arsenic may be sold without such admixture, in a quantity of not less than ten pounds at any one time.

4. If any person shall sell any Arsenic, save as authorized by this Act, or on any sale of Arsenic shall deliver the same without having made and signed the entries hereby required on such sale, or without having obtained such signature or signatures to such entries as required by this Act, or if any person purchasing any Arsenic shall give false information to the person selling the same in relation to the particulars which such last-mentioned person is hereby authorized to inquire into of such purchaser, or if any person shall sign his name as aforesaid as a witness to a sale of Arsenic to a person unknown to the person so signing as witness, every person so offending, shall for every such offence, upon a summary conviction for the same, before two justices of the peace in *England* or *Ireland*, or before two justices of the peace or the sheriff in *Scotland*, be liable to a penalty not exceeding twenty pounds.

5. Provided, That this Act shall not extend to the sale of Arsenic when the same forms part of the ingredients of any medicine required to be made up or compounded according to the prescription of a legally qualified medical practitioner, or a member of the medical profession, or to the sale of Arsenic by wholesale to retail dealers, upon orders in writing in the ordinary course of wholesale dealing.

6. In the construction of this Act, the word "Arsenic" shall include Arsenious

42 RESOLUTIONS OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

Acid and the Arsenites, Arsenic Acid and the Arseniates, and all other colourless poisonous preparations of arsenic.

THE SCHEDULE.

Day of Sale.	Name and Surname of Purchaser.	Purchaser's Place of Abode.		Condition or Occupation.	Quantity of Arsenic sold.	Purpose for which required.
1 September, 1851.	John Thomas	Hendon	Elm Farm	Farm Labourer	5 pounds	To steep wheat.

(Purchaser's Signature).

John Thomas.

Or, if purchaser cannot write, Seller to put here the words, "cannot write."

Witness,

James Stone,

Grove Farm, Hendon.

(Seller's Signature).

George Wood.

RESOLUTIONS UNANIMOUSLY ADOPTED BY THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH,

REGARDING PRACTITIONERS OF HOMŒOPATHY.

At Edinburgh, and within the College Hall there, the 9th day of May, 1851, an Extraordinary Meeting of the Royal College was held, pursuant to a Resolution agreed to at the last Quarterly Meeting, and of which Extraordinary Meeting due notice was given. The PRESIDENT in the Chair. The following Resolutions were moved, seconded, and unanimously agreed to:—

I. That the Royal College of Physicians of Edinburgh did, several years ago, publicly express its opinion of Homœopathy and Homœopathic Practitioners, by peremptorily declining to admit into its body a Candidate for its Fellowship who belonged to that denomination; and, consequently, that no Fellow of the College can possibly be ignorant of the light in which all those who practice Homœopathy are regarded by the College.

II. The College regrets that, notwithstanding this decided expression of its opinion, more than one of its Fellows, after being admitted in a different character, have endangered the reputation of the College by becoming Homœopathic Practitioners; and the College expresses an earnest hope that these Fellows, seeing they have thus virtually separated themselves from the College, will spontaneously sever their further connection with an Institution which repudiates them, and from which they can derive, as merely nominal Fellows, nothing else than a false position and a spurious credit.

III. The College feels the more bound thus to express its opinion, seeing that those Fellows who have become Homœopathists, and any other Medical Practitioners who follow Homœopathy, must necessarily be aliens to the other Fellows, and to the profession at large; inasmuch as no Fellow of this College, or any other Physician can, by any possibility, without derogating from his own honour, and from the honour of the profession, meet Practitioners of Homœopathy in consultation, or co-operate with them in the other common duties of professional life.

IV. That although the College has not thought it expedient hitherto to take any active steps for disclaiming those Fellows who have become Homœopathic Practitioners subsequently to their admission to the College, nevertheless, since it has the power of dealing summarily with those who act in a manner so unbecoming the character of a Physician, it reserves its right to exercise that power when it shall be so advised.

Signed in Name, and by Authority, of the College, J. Y. SIMPSON, *President*.

At a meeting of the ROYAL COLLEGE OF SURGEONS of EDINBURGH, held on the 16th instant, the following resolutions were moved by the President, and unanimously adopted:—

1. The College having considered a series of resolutions transmitted by the Royal College of Physicians, in regard to Homœopathy, feel called upon to express their opinion that the system so designated being entirely inconsistent with the principles professed by candidates for the diploma of the College of Surgeons, any Fellow or Licentiate who practices it, or countenances others in doing so, by meeting them in consultation, will justly incur the disapprobation of the College.

2. That a copy of the above resolution be transmitted to the Royal College of Physicians.

Signed in Name, and by Authority, of the College, JAMES SYME, *President*.

Dr. Henderson to the Secretary of the Royal College of Physicians (Edin.)

SIR,—I have to acknowledge the receipt of a copy of a series of Resolutions adopted by the Royal College of Physicians on the 9th current, and which, you say, you have been instructed to send me.

Some parts of these resolutions are so intemperate and insulting, as to be discreditable to the body from which they emanate; and though you take pains to inform me that the resolutions as they stand, were unanimously adopted by the College, I shall do some of the Fellows the justice to believe that they have so much good sense and gentlemanly feeling as to be incapable of impugning the honour of any one because he differs from them in the choice or dose of a drug; although they may, from absence or inadvertence, have appeared to acquiesce in the sentiments of some less scrupulous associate.

To the framer of these resolutions I would willingly confine the disgrace of what is outrageous in their tone and tenour; but as they are sent forth in their present offensive shape in the name of the College, I am precluded from replying now to such parts of them as may fairly be mooted among courteous and upright men, nor can I reply to them at any time until the College shall address me in a more becoming style.

The unusual title, "Practitioner of Homœopathy," with which you endorse your letter to me, is doubtless intended as an additional insult, whether suggested by the Royal College, or the spontaneous fruit of your own taste. I received the proposed indignity with composure; for I fully believe, and have long acted on the belief, temperately yet firmly, and undeterred by much misrepresentation and abuse, that what is termed the "Homœopathic principle," is by far the most important and the most extensively useful of the principles hitherto discovered, which ought to regulate the practice of medicine; and if physicians are to be classed by distinctive epithets as homœopathic, allopathic, and antipathic, according as they prefer one therapeutic principle or another in their practice, I am abundantly satisfied,—and the reasonable part of the public will, I have no doubt, concur with me,—that, under each designation, whether belonging to a Royal College or not, there will rank the usual proportion of worthy and of questionable men. Before the College commits itself further on this subject, however, I would caution it against a difficulty it will encounter in the attempt at classification, and the other measures it may have in view, by reminding it of the discussion which took place on the occasion to which its first resolution adverts, in which it was strongly, and no doubt truly urged by a president of the very same body, that those who are designated Homœopaths had no exclusive right to that title, seeing that the homœopathic action of remedies was as distinctly admitted by the profession at large as it was by them.

I write to you, of course, in your official capacity, and therefore have the honour to be, your very obedient servant,

Northumberland-street (Edinburgh) May 12, 1851.

WILLIAM HENDERSON.

It may be proper to add, that the Secretary has acknowledged the title referred to above to have been given on his own responsibility; while he has ingeniously regretted that it should have been taken as an insult. It never was so taken, but was simply asserted to have been intended as an insult; and who can doubt that it was, who has read the resolutions? W. H.

[Notwithstanding the virtuous indignation of Dr. Henderson, he has begged the question. The real question at issue does not refer to the *modus operandi* of medicines, but to the frauds practised by means of sugar-plums placed on the tongue, passed under the nose, or applied to the credulity of patients.—ED. PH. J.]

PROPOSED MUSEUM OF THE CHEMICAL SOCIETY.

ALTHOUGH the Chemical Society has for many years enjoyed a name under which, we trust, it will long continue to flourish, it has not, until lately, possessed a local habitation. The society is now located in Cavendish Square, in one of the houses at the back of the Polytechnic Institution, where a suite of rooms has been taken for a term of years. Accommodation is thus obtained for the arrangement of already valuable collection of books in a commodious library, and for the formation of a museum of chemical products, and illustrative specimens. To promote this latter object a committee has been appointed, and communications have been made with some of the exhibitors at the Crystal Palace, from whom there was reason to anticipate assistance and co-operation in this useful undertaking.

From this source it is not unlikely that a nucleus may be formed which, by suc-

cessive additions, may ultimately grow into a very important and instructive museum, worthy of the Chemical Society.

In a few short weeks the great Exhibition will yield up its treasures to be distributed in different quarters of the globe, according to the arrangements made with the exhibitors, many of whom may be disposed to deposit their specimens in museums where they will be permanently appreciated, instead of removing them to their own laboratories or warehouses, where they will merge in the general stock and be forgotten.

In this distribution we hope the museum of the Pharmaceutical Society, and the museum at Kew Gardens, will not be overlooked.

THE CAVENDISH SOCIETY.

THE advantages of this society have been pointed out in former numbers of this Journal. It has already been instrumental in placing in the hands of the Chemist many valuable and standard works, which would not have been undertaken as a speculation by any publisher. The certainty of a definite number of subscribers enables a society of this description to calculate the cost and probable returns, and this facilitates the publication of works of an expensive character, which would not remunerate the publisher in the ordinary way of business. In this society every member is directly interested in using his influence with his friends to extend the lists of member, since the number of books to be received for the guinea depends on the number of subscribers. The report of the council, which was read at the last anniversary, is highly encouraging.

The progressive advancement of the Society is indicated by the increasing number of its Members; and we hope that a similar extension will be effected during the ensuing year. Considering the greatly increased extent to which the science of Chemistry has been cultivated in this country within the last few years, as compared with former times, it may be confidently anticipated, as the published works of the Society become better known, that the advantages resulting from such an Association will be more amply and adequately appreciated. The number of Members has undergone a slow but constantly occurring augmentation, and if the aggregate number be still not so great as it is desirable it should be, there is, nevertheless, every reason to believe that the limit to further extension has not been reached.

The Members have received the fourth and fifth volumes of Gmelin's *Handbook of Chemistry* for the past year, and Dr. Wilson's work on the *Life and Writings of Cavendish* has been distributed. It was thought desirable to proceed with as little delay as possible in bringing out the former of these works, of which there remains but one more volume to complete the Inorganic part, and this the Members will receive in the course of the present year. The delay that has attended the publication of the *Life of Cavendish* was unavoidable; but we have reason to believe that it has been more than compensated for by the large amount of interesting matter which the author was enabled to collect whilst seeking for some of the details of the biography without which he was unwilling to send his work before the public. The characteristic portrait of Cavendish, which forms the frontispiece to the book, has been obtained through the instrumentality of a Member of the Society, Mr. Tomlinson. It is copied from a drawing by Alexander, in the print-room of the British Museum, and is considered by those who knew the philosopher to be a good and striking likeness. These accessions of matter have not only enhanced the value of the work as a literary production, they have also added to the expenses of publication,—a result which makes it necessary to limit the works issued for 1850 to the two volumes of *Gmelin's Chemistry* now in the hands of the Members.

There are several works in course of preparation, to be published in this or succeeding years.

The first volume of the translation of Lehmann's *Physiological Chemistry*, by Dr. Day, is now in the hands of the printer, and this will be the first of the books to be issued for 1851. It will be followed by the sixth volume of Gmelin's *Chemistry*, which will conclude the Inorganic part of this work. The Organic part will then be immediately proceeded with.

The translation of the *Essays of Saussure* is prepared, and the abstracts of the works of Hales, Ingenhouz, Sennebier, Wiegmann, and other contemporaneous writers on the chemistry of vegetation, are nearly completed.

Some of the Members have expressed a desire that the translation of Bischoff's *Elements of Chemical and Physical Geology*, which is among the works proposed for publication by the Society, should be commenced at an early period; but the Council have not, hitherto, found it practicable to make arrangements to this effect without retarding the completion of books previously undertaken.

It has been suggested to the Council, that a valuable work, for the use of practical chemists, might be prepared through the co-operation of the Members of this Society. Most men engaged in scientific investigations, have occasion to refer to tables for facilitating the calculation of results; yet there is no work extant in which there is a good and complete collection of such as relate to all the different departments of applied chemistry. It is proposed that the publication of a work, to be entitled *Chemical Formulae and Constants, for use in the Laboratory*, be undertaken by the Society; and should this proposition be favourably received by the Members and a prospect afforded of the means of obtaining the required matter, the Council will be prepared to carry it into effect.

The first of the Society's publications, the volume of *Chemical Reports and Memoirs*, edited by Professor Graham, being out of print, those who now join the Society, and desire to obtain the whole of Gmelin's *Chemistry*, are supplied with the first volume on payment of half the subscription for 1848. In anticipation of a continued demand, by new members of the Society, for all the volumes of Gmelin's standard work, a larger number was printed than was immediately required, and copies still remain on hand.

We intend next month to give a notice of the *Life and Writings of Cavendish*.

MEDICAL BENEVOLENT COLLEGE.

A MEETING was held at the Hanover Square Rooms, on Wednesday, June 25, Earl Manvers in the chair, for the purpose of establishing a Medical Benevolent College, projected by Mr. Propert.

The circumstances out of which this undertaking originated are remarkable, and reflect much credit on the projector. Mr. Propert was among the early supporters, and the President of the Medical Protection Society, at a time when that institution was supposed to be what its name implied, and when many medical practitioners of the highest respectability were also connected with it. When abuses arose in consequence of the artful and dishonest practices of certain parties in the office, an investigation was demanded, the result of which we briefly stated in a former number. It having been ascertained that funds to the extent of between 2000*l.* and 3000*l.* collected on behalf of members had been abstracted, Mr. Propert, feeling that as the President of the Society he had been innocently instrumental in inspiring confidence in the management, most liberally resolved that this confidence should not prove to have been misplaced, and voluntarily made himself personally responsible for the entire amount which was deficient. The members have therefore received the sums due to them from the Society out of the private resources of the President; and being desirous of testifying their sense of this honourable conduct, they pledged themselves to support any institution which he might project for the benefit of the profession.

Mr. Propert, conceiving that a benevolent institution, comprising a building capable of affording an asylum in their advanced years to unfortunate members of the profession, with a college for the education of their children, would be instrumental in relieving a large amount of distress and suffering for which no provision already exists, proposed the establishment of the institution, which was formally ushered into existence on the 25th of June, in the Hanover Square Rooms.

Without giving a detailed report of the meeting, it will be sufficient to state that the resolutions were passed unanimously by a numerous and very respectable audience. The Bishop of London moved, and Sir Robert Harry Inglis seconded, the first resolution, founding the Society, the merits of which were fully detailed in the course of the meeting. It was announced that Dr. Graham, of Epsom, had given twenty acres of land in that neighbourhood, at a small rental during his life, with the reversion in fee, for the erection of the building, and that subscriptions to the amount of above 2000*l.* had already been received.

When the Benevolent Fund of the Pharmaceutical Society was founded, and also on the occasion of the dinner for promoting that object, some members of the medical profession were among the contributors. Reciprocity in worthy and benevolent undertakings of this description is a mutual advantage. We therefore think an announcement of the establishment of the Medical Benevolent College is not out of place in our pages.

NOTICES OF BOOKS.

- THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA**, by Authority of the National Medical Convention, held at Washington, A.D. 1850. Philadelphia: Lippincott, Grambo and Co., 1851. 8vo, pp. 317.
- A TRANSLATION OF THE NEW LONDON PHARMACOPEIA**, including also the *New Dublin and Edinburgh Pharmacopœias, with a full Account of the Chemical and Medicinal Properties of their Contents; forming a complete Materia Medica*. By J. BIRKBECK NEVINS, M.D., Lond., &c., &c. London: Longman, Brown, Green and Longmans, 1851. Small 8vo, pp. 480.
- MEMOIRS OF WILLIAM ALLEN, F.R.S.** By JAMES SHERMAN, Minister of Surrey Chapel. London: Charles Gilpin, 5, Bishopsgate Street, Without. Edinburgh: Adam and Charles Black. Dublin: J. B. Gilpin. 8vo, pp. 483.
- FAMILIAR LETTERS ON CHEMISTRY in its Relations to Physiology, Dietetics, Agriculture, Commerce, and Political Economy**. By JUSTUS VON LIEBIG. Third edition, revised and much enlarged. London: Taylor, Walton, and Maberly. Small 8vo, pp. 530.
- PHARMACOPEIA NOSOCOMII IN CURAM MORBORUM CUTANEORUM. FUNDATI, A. D. MDCCCLXI.** London: S. Highley. 18mo, pp. 48.
- THE LAWS OF HEALTH, IN RELATION TO MIND AND BODY.** By LIONEL JOHN BEALE, M.R.C.S. London: John Churchill. 8vo, pp. 306.
- A COMPENDIUM OF MATERIA MEDICA AND PHARMACY, adapted to the London Pharmacopœia, embodying the New French, American, and Indian Medicines; a Summary of Practical Toxicology, with the Abbreviations used in Prescriptions.** By J. HUNTER LANE, M.D., F.L.S., &c. 2d edit., pp. 310. John Churchill.
- THE WISDOM AND BENEFICENCE OF THE ALMIGHTY AS DISPLAYED IN THE SENSE OF VISION. (The Actonian Prize Essay for 1851).** By T. WHARTON JONES, F.R.S., &c. Small 8vo, pp. 135. John Churchill.
- AN INQUIRY INTO VACCINATION.** By BENJAMIN RIDGE, M.D., &c. Pp. 32. John Churchill.
- REVIEW OF THE MANUSCRIPT ANNALS OF THE COLLEGE OF PHYSICIANS OF LONDON FROM 1682 TO 1749.** By J. L. PETIT, M.D., &c., pp. 12.
- LONDON UNIVERSITY CALENDAR, 1851.**
- DE L'ORGANISATION DE LA PHARMACIE EN FRANCE, considérée dans ses Rapports avec la Propagation des Science d'Application.** Par DORVOUT. Pp. 30. Paris: Felix Malteste & Cie.

OBITUARY.

RICHARD HOTHAM PIGEON, Esq.,
late Treasurer of the Pharmaceutical Society.

THE duty of preparing a short notice of the life of the late valued Treasurer of the Pharmaceutical Society, recalls to our recollection the associations of early days, and the many acts of kindness and public utility, which reflect a cheerful colouring on the retrospect, in proportion as they demonstrate the extent of the loss which society has sustained.

Mr. Pigeon was born on the 22nd of May, 1789, and received his early education at Dr. Willett's academy, Loughborough House, Brixton. At the age of sixteen he was apprenticed to the firm of Fynmore and Palmer, in which he was, in 1812, admitted as a partner, without premium, on account of his assiduity and the value of his services in the business. In 1835 Mr. Pigeon was unanimously elected Treasurer of Christ's Hospital, in which capacity his tact and zeal in the performance of his duties conferred a lasting benefit on that institution. The increase in the funds, the accession of governors, and the improvement in the management are emphatically and concisely described in the following statement, with which we have been favoured (in reply to an inquiry) by a gentleman connected with Christ's Hospital:—

"	Number of Governors, 5th June, 1835	395
"	1st " 1849	510

Increase..... 115

notwithstanding that the donation required as a qualification was increased in 1841 from £400 to £500. The whole number of Governors made during the fourteen years of Mr. Pigeon's Treasurership was 264.

"	Number of children in the Hospital on the 5th June, 1835	1141
"	1st " 1849	1469

Increase 328

"But the benefits derived by Christ's Hospital from the Treasurership of Mr. Pigeon are not to be estimated solely by the increase in the number of its governors and of the children maintained and educated on the foundation. Great improvements were made in the system of education, many of them at his suggestion, and all of them by means of his advocacy and support. The introduction of the French language and the increase in the number of scholars sent to the universities upon exhibitions from the institution, from two to four annually, may be particularly mentioned. Nor are the children less indebted to him for many additions to their personal comforts, as well as many judicious alterations in the internal economy and domestic arrangements of the institution.

"In February, 1843, her Majesty presented a donation of £1000 to the Hospital, and condescended to permit her name to be enrolled among its governors. In the following month (March, 1843), H. R. H. Prince Albert also gave a donation of £500, and accepted a governor's staff. In March, 1844, her Majesty gave a donation of £500 in the name of H. R. H. the Prince of Wales; and again in April, 1848, a similar donation in the name of H. R. H. Prince Alfred; and her Majesty was pleased, at the request of the governors, to accept a governor's staff for both the princes. On Sunday evening, the 9th March, 1845, her Majesty and her illustrious consort honoured Christ's Hospital by a visit, to witness the public supping of the children, on which occasion her Majesty and the Prince were received by the President, Mr. Alderman Thompson, and the Treasurer, Mr. Pigeon, the arrangements for the ceremony having been made entirely under the direction of the latter. On the following day, her Majesty and the Prince were pleased to express (through Mr. Anson) the gratification they had derived from their visit, and their unqualified approval of the arrangements made for the occasion.

"His Royal Highness the Duke of Cambridge (then Prince George) became a governor of the Hospital on presenting the usual donation of £500, in April, 1841, and is now a member of the Committee of Almoners. His Royal Highness's father, the late duke, took a great interest in the institution, and was a frequent visitor at the public suppers of the institution during the period of Mr. Pigeon's Treasurership."

We may add, that in 1845 a portrait of Mr. Pigeon, by J. P. Knight, R.A., was presented by the governors to Christ's Hospital; and on his retirement, in 1849, he received very gratifying testimonials from the governors, from the masters and officers, and also from the Grecians, on behalf of the school.

Mr. Pigeon was one of the most respected members of the old Wholesale Druggists' Club, a commercial association established for the purpose of discussing matters affecting the interests of the wholesale trade, the members of which were in the habit of meeting on 'Change, and occasionally settled knotty points over a city dinner.

In 1842, when the apprehension of injury and interference caused the Chemists and Druggists to unite in opposing a Bill then before Parliament, and a standing Committee was appointed to watch the proceedings of the Bill, Mr. Pigeon was called to the chair at the first meeting at the Crown and Anchor, and liberally offered the use of a room in his house for the meetings of the Committee. Frequent meetings were held by the Committee during several weeks, and although Mr. Pigeon as a wholesale Druggist, and therefore not directly interested in the question at issue, did not take a prominent part in these proceedings, he lent a helping hand at the time of need, and with his usual tact and *suaviter in modo*, assisted in preserving harmony and promoting the object in view. It was his custom to "pour oil on the troubled waters," and when any difference of opinion arose, he generally contrived to throw out a suggestion tending to lead to a satisfactory solution of the difficulty. His words were few, but always to the purpose.

On the establishment of the Pharmaceutical Society Mr. Pigeon was elected Treasurer, and was annually re-elected to that office until the year 1850, when the state of his health obliged him to decline the re-appointment. In this capacity he regularly attended the meetings of the Council as long as his health would permit; and on all occasions manifested that conciliatory disposition and unobtrusive zeal in the discharge of his duties, which characterised the whole of his career in public life.

Mr. Pigeon's health began to fail in 1848, an event attributable in some degree to the laborious occupation belonging to the onerous offices which he filled. In 1849 he retired from his public duties: his bodily strength gradually declined, although he retained his mental faculties to the last. On the 9th of June he had an attack from which he did not rally, and he expired on the following day, in the 63rd year of his age.

TO CORRESPONDENTS.

Proof Spirit.—The proportions of rectified spirit and water for making proof spirit, are five parts by measure of the former, and three of the latter.

W. C. D.—Yes.

E. D. R. (Bristol).—See vol. i., page 399 (tinct. Kino).

B. I. H.—Standard gold: 11 parts gold, 1 part copper. Silver: 11.10 silver, 0.90 copper, iron pyrites, Fe. S₂. Dolomite, a magnesian limestone, containing generally forty per cent. of carbonate of magnesia.

C. J.—(1.) Blane's *Veterinary Art*.—(2.) Wilson's *Anatomists' Vade Mecum*.

Ellis (Bath).—(1.) No.—(2.) Yes.—(3.) Yes.—(4.) Animal charcoal would decolorise but most likely impair its efficacy.—(5.) Bug poison. Camphor dissolved in spirit of turpentine.

MEDICAL COLLEGIATE INSTITUTION.—Dr. Brindley, of Tarvin Hall School, near Chester, has announced the prospectus of an establishment for the education of boys who are about to enter the Medical profession, in which will be taught French and German, chemistry, botany, elementary mathematics, comparative anatomy, &c. The institution is commended in the provincial *Medical and Surgical Journal*. The value of preliminary education to Medical practitioners and also to Chemists, cannot be too highly estimated. Such an establishment would be useful to our Pharmaceutical Students, some of whom have not the advantage of so good a classical education as could be desired.

A registered Apprentice (Yarmouth).—The answer to the question must depend on the nature of the powder. If deliquescent the air should be carefully excluded. Some powders keep as well or better when the stopper is not air-tight.

Semper (Berwick).—Though oil of vitriol is not to be depended on as a test for cod-liver oil, it is the best test we are acquainted with. This is fully explained by Dr. Pereira in the article to which we referred last month.

The health of Plymouth.—We have received a communication from Dr. Hamilton refuting a recent statement of the Registrar-General, that "Plymouth is remarkable for its insalubrity." Dr. Hamilton furnishes some statistical returns and explanatory remarks, which appear to substantiate his views in opposition to those of the Registrar-General. The article is too long for insertion.

Mr. Winter.—See the article at the commencement of this number.

A Subscriber.—The anticipations respecting the over-crowding of London have been disappointed. The hotels and lodging-houses are not more than usually occupied.

B. E.—(1.) Finely divided copper may be obtained by immersing zinc into an acid solution of sulphate of copper; or by reducing oxide of copper in a current of hydrogen gas.—(2.) The salt made as described would be a protonitrate of mercury.

We have received so many communications from Correspondents on the subject of the Pharmacy Bill that we fear the acknowledgement of some of them may have been inadvertently omitted, we take this opportunity of acknowledging the following:

Messrs. C. Fisher, Ramsgate; T. Barling, Weymouth; G. Marks, Bradford, Wilts; W. Reynolds, Halesworth; S. Horner, Hartlepool; T. Goode, Congleton; W. Coates, Wakefield; G. Whitter, Horncastle; H. W. Sanders, Kingsdown, Bristol; S. Thornton, Exmouth; B. Morgan, Llandillo; Mays, South Shields; Radley, Sheffield; J. Ritson, Sunderland; Shaw, Stockport; Orridge, Bucklersbury; W. Paine, Canterbury; G. Cubitt, Norwich; F. Cupiss, Diss; T. Thompson, Derby; Grounds, Ludlow; J. Trix, Exeter; J. B. Edwards, Liverpool; G. W. Gill, Walworth Road; J. Beaton, Shoreditch; J. H. Bland, Stourbridge; Knott, Exeter; Mercer, Liverpool; Martin, Guilford; A. Sunderland Chemist.

The suggestions on the subject of the Bill will receive due attention.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Other Communications to the EDITOR.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. II.—AUGUST 1st, 1851.

THE PROGRESS AND PROSPECTS OF THE PHARMACY BILL.

THE second reading of this Bill occurred the day after the publication of our last number. Up to that time no intimation of opposition had been given, numerous petitions in favour of the Bill had been presented, and a general impression appeared to prevail that the Bill was likely to pass. Still it was impossible to calculate before hand what might be its reception in the House, or from what source opposition (if any) might arise.

Some suggestions had been received since the circulation of the Bill, and the discussion on the second reading furnished hints for further amendments, which were introduced in committee. The amended Bill will be found at page 61.

The third and fourth clauses were added to enable members residing in the country to vote by proxy at the election of officers. The omission of this provision in the charter was accidental, as it was originally supposed that this was a matter of detail which could be regulated in the byelaws, which was afterwards found not to be the case.

In consequence of communications from the Lord Advocate of Scotland and Sir William Gibson Craig, M.P., the twelfth clause was introduced, which is nearly in accordance with the proposition contained in the following Resolutions:—

At a Meeting of Chemists and Druggists, held in Mr. Macfarlane's, 17, North Bridge, on the 14th July, 1851, present—Messrs. Davenport, Duncan, Gardner, Lindsay, Macfarlane, and Mackay, the following Resolutions were proposed and unanimously adopted:—

"1st. That in the opinion of the Meeting, fit and proper persons to conduct all such examinations as are provided for or contemplated by the Pharmaceutical Bill, in so far as the said Act relates to Scotland, should be appointed by Members of the Pharmaceutical Society resident in Scotland.

"2nd. That the meetings of those persons so appointed should be held in Edinburgh, with the same powers as are conferred on any other Examining Board appointed under this Act."

Edinburgh, 14th July, 1851.

JOHN MACKAY, *Secretary.*

We subjoin the report of a meeting of the

SOCIETY OF CHEMISTS AND DRUGGISTS OF ABERDEEN.

At a Meeting of the Society of Chemists and Druggists of Aberdeen, held in their Library Room, on Wednesday Evening, July 2d, 1851, specially called by the President, for taking into consideration a Bill introduced into Parliament by Jacob Bell, Esq., M.P., for regulating the Qualification of Chemists and Druggists, and conferring certain privileges on the Pharmaceutical Society of Great Britain. Present—Messrs. Forsyth (President), Williamson, Urquhart, Keith, Sutherland, Jamieson, Reid, Sinclair, Paterson, Sangster, Findlay, and Davidson (Secretary).

The Secretary having read from the *Lancet* the clauses of the proposed Bill, the Members were satisfied generally as to the propriety of legislative interference being necessary to prevent the public from being deceived by incompetent persons assuming the title, and presuming to exercise the functions of well qualified Chemists; but they were of opinion that it would entail great inconvenience if the Board of Examiners were confined to London, instead of having examinations conducted in various districts; and while the Members of this Society have observed with great satisfaction the rise and progress of the Pharmaceutical Society of Great Britain they cannot but express a desire that the existence of their own Society, more than two years before the Pharmaceutical Society was formed, ought to be communicated to the Members of that Society.

The Society of Chemists and Druggists of Aberdeen was established on the 2nd February, 1839, for the purposes for which the Pharmaceutical Society of Great Britain was formed, and although the number of its members has been few, yet they have been able to furnish for the use of themselves and their Assistants and Appren-

tices, a library containing upwards of 500 volumes of the books most suitable for imparting the knowledge of the theory and practice of Chemistry and Pharmacy, and they have had lectures delivered occasionally, which have been found most useful and instructive, besides that many of the Apprentices have been sent to the University classes.

The Members of the Society were at this Meeting in doubt whether it was the intention of the proposed Bill to give exclusive privileges to the Pharmaceutical Society, or to compel all persons using the name of Chemists or Druggists to become Members of the Pharmaceutical Society, because if such was the intention it would be become necessary to attend to their own interest, and resist any compulsory measure by every means in their power; but in order to obtain further information on the subject, it was proposed by Mr. Jamieson, seconded by Mr. Paterson, and cordially agreed to, that a Committee composed of the Chairman, Messrs. Williamson, Urquhart, and the Secretary, should be appointed to go over the clauses of the Bill minutely, to correspond with Mr. Bell, or any of the other Members of the Pharmaceutical Society, and be able as soon as possible to report to a General Meeting of this Society of Chemists and Druggists.

WILLIAM FORSYTH, *President*.

The requisite information having been furnished, we have received a reply from the Secretary, expressing approval of the amendments introduced, and a desire that Scotland may participate in the benefit of the Bill.

Some anxiety having been expressed by Assistants and Apprentices in various quarters, lest the Bill should operate injuriously on the interests of those who have already entered the business, a provision was inserted in the tenth clause exempting them from interference. The following report from Liverpool may be taken as an indication of the general sentiments of those who have corresponded on this subject:—

At a Meeting of Chemists' and Druggists' Assistants and Apprentices, held on Thursday evening, 3rd July, 1851, at Brown's Temperance Hotel, Clayton Square, Mr. N. MERCER in the chair,

It was moved by Mr. SAWBRIDGE, seconded by Mr. WILLIAMS, and *resolved* "That, in the opinion of this Meeting, the clause in the Pharmaceutical Bill now before the House of Commons, which gives the Council of the Pharmaceutical Society the power of requiring from all Assistants and Apprentices in the Drug trade, who are not Associates of the Pharmaceutical Society, a certificate of examination before they can be recognized as legally qualified Chemists and Druggists, is injurious to their interests and an infringement upon their privileges."

It was moved by Mr. BARKER, seconded by Mr. ADAMS, and *resolved*, "That while this Meeting fully appreciates the advantages to be derived from pursuing the course of study required by the Council of the Pharmaceutical Society, it at the same time considers that the passing of an examination should be perfectly voluntary on the part of all who are now in the trade, and requests the Council to insert a clause in the Bill to that effect."

It was moved by Mr. WEANIE, seconded by Mr. HAMMOND, and *resolved*, "That a copy of these Resolutions be forwarded to Jacob Bell, Esq., and to the Council of the Pharmaceutical Society."

A Committee was also appointed to watch the progress of the Bill.

N. MERCER, *Chairman*.

The twelfth clause (now the 15th) has been modified by the addition of the words, "except persons carrying on the said business at or before the passing of this Act." The effect of this addition is to make registration permissive but not compulsory; the existing rights and privileges of all persons, whether registered or not, being reserved; and the Council being empowered to register those who may furnish satisfactory evidence of their claim. This reduces the responsibility of the Council, a discretionary limit being placed on the list of registered Pharmaceutical Chemists, while no injury is inflicted on those whose names are not included in that list. A provision is also added in favour of the widows of Chemists.

The eighteenth clause in the original Bill, prohibiting Medical Practitioners from assuming the name of Chemists, &c., is erased at the desire of the Master and Wardens of the Society of Apothecaries, who are favourable to the Bill

provided all the privileges of Medical Practitioners are left *intact*. The Colleges of Physicians and Surgeons of London are also favourable to it. As the Bill now stands it does not in any way affect any Medical Practitioner, consequently it is impossible for the Medical Profession to raise any valid objection against the Bill. A very large number of the most influential medical men have signed petitions in its favour.

To prevent needless tautology an interpretation clause is added, defining the term Pharmaceutical Chemist to include Chemist and Druggist, and other terms bearing the same signification.

A few verbal amendments of trifling importance have been introduced to meet imaginary objections, and remove all pretext for opposition.

These several modifications were duly considered by the Committee appointed by the Council to watch the progress of the Bill; and although the stringency of the measure had been in some degree impaired by the exemptions and alterations which it had been found necessary to introduce, yet it was the unanimous opinion of the Committee that in its present form it would give a stimulus to education, establish the principle of a qualification in Pharmacy, and gradually but effectually raise the character of the Pharmaceutical Chemists of this country.

The clause, of which Mr. Lacy gave notice (see page 57) having been considered by the Committee the following resolution was passed:—

Resolved, "That in the opinion of this Committee, the provisions contemplated in the said Clause are practically inconsistent with the object in view, and by creating in the mind of the patient a fallacious confidence in the form of the bottle, would be likely to lead to much confusion and numerous accidents.

"The Committee consider that the practice of affixing distinct and proper labels on all bottles containing dangerous medicines, or external applications, is the most efficient and universally applicable precaution against accidents."

THOMAS HERRING, *Chairman*.

A very extensive correspondence on the subject led to the belief that notwithstanding slight differences of opinion in reference to some of the minor details, the principles and tenor of the Bill were generally approved, and this impression was confirmed by the influx of petitions from all quarters in its favour.

The objections raised in the House on the second reading, resolve themselves into two. First, The dread of creating a monopoly, and thus interfering with free trade in medicines. Secondly, The idea that the tendency of the Bill would be to convert Chemists into medical practitioners. With regard to the first of these objections—the Bill goes no farther than to establish a special qualification in Pharmacy, and to prohibit unqualified persons from deceiving the public by pretending to be what they are not; and when the several exemptions are considered, it must be admitted that a more diluted measure of reform could scarcely be framed. It has in fact, been urged as a defect in the Bill (and not without some reason) that it is not sufficiently stringent to rectify the abuses which prevail. A partial remedy is better than none, and on this ground the Bill is worthy of support as a step in the right direction, but the idea that it would interfere with free trade is a delusion. The Apothecaries' Act of 1815 has not limited the number of Apothecaries, but it has called into existence a very superior class of practitioners. The Pharmacy Bill is calculated to produce a similar result in the Pharmaceutical department. At the same time, it differs from the Apothecaries' Act, in conferring no medical or surgical distinction, and the idea that it will lead Pharmaceutical Chemists out of their proper sphere, is therefore founded on error.

The only adverse petitions which have been presented, are from the Royal College of Surgeons, of Edinburgh, and the Faculty of Physicians and Surgeons, of Glasgow. We have published the petitions (page 59) to inform our readers as to the nature of the objections, which it will be seen, refer chiefly to provisions or defects in the original Bill, which have been removed or rectified. It is reasonable and proper that Examiners should be appointed for Scotland, and

this had been conceded in compliance with the wishes of the Chemists in Edinburgh, as above stated. It remains, however, to be decided whether the Examiners are to be nominated by the Members of the Society residing in Scotland. If so, some arrangements will be necessary, for which opportunity is afforded by the postponement of the Bill until next session. Whatever may be the decision on this point, it is important that uniformity in qualification should be maintained, and for this purpose both Boards should be under the same jurisdiction and regulations.

The Pharmaceutical Society of GREAT BRITAIN was intended to comprise the Chemists of the United Kingdom, and we think it would not be difficult to constitute the two Boards in such a manner as to be satisfactory to both parties.

There is, however, in the two petitions before alluded to, one demand, which is at variance with the principle of the Bill. We allude to the power claimed by the College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, to examine and license Pharmaceutical Chemists. The principle of self-government has always been maintained as essential by the Pharmaceutical Society. The English Chemists resisted the proposal to refer them to Apothecaries' Hall for examination, and they organised themselves and became incorporated for the purpose of providing the requisite jurisdiction, and the machinery for conducting the pharmaceutical examinations. As a security against any abuse of power, the second clause of the proposed Bill provides that the byelaws shall be submitted for approval to the Secretary of State, and to a general meeting of the Members, and subject to this approval, the jurisdiction is vested in the Society.

The Colleges of Physicians and Surgeons regulate the examination of the Members of their respective bodies, and the Society of Apothecaries enjoys a similar privilege. The Chemists ask no more, and will not be satisfied with less. It is obvious that much confusion would arise, if every Medical or Surgical College were to participate in the functions of examining and licensing Chemists. There would be no uniformity of qualification. It would be the interest of each Examining Board to attract candidates by lowering the standard of examination. The Chemists would sacrifice their independence, and, instead of being united into one body, would become half-bred licentiates of the several Medical Colleges, a kind of parasitical nondescript, deriving their *locus standi* from Colleges, which, having taken their fees, would not acknowledge them as Members.

The proceedings in the House of Commons, in reference to the Pharmacy Bill, are subjoined. We may here observe, that the postponement of the Bill until next session, must not be considered as a source of discouragement. It is a step in advance to obtain the recognition of the principle of the Bill, and it was not to be expected that a measure of this description, on a subject so little understood in the House, and generally considered to be intricate and difficult, should pass without due consideration. Although the prospect at one time appeared favourable, the late period of the session, and the pressure of other business interfered with the progress of the Bill. It would not have been policy under these circumstances to hazard its rejection by a division, and it was thought better to take the second reading on the terms prescribed by the Secretary of State, with the understanding that the question should be resumed at the commencement of next session. In the meantime it is not improbable that some further amendments may be suggested.

The Pharmacy Bill has been favourably noticed in most of the Medical journals. The *Medical Times* is an exception—a circumstance easily understood. The *Medical Times* is a journal which aspires to rival the *Lancet*. Mr. Wakley, the editor of the *Lancet*, having declared himself in favour of the Pharmacy Bill, the editor of the *Medical Times* of course cuts it up. The publisher of this Journal is also the publisher of the *Medical Times*, and naturally favourable to controversy as a stimulus to circulation. This *editorial status* does not affect the merits of the question at issue.

PROCEEDINGS OF THE HOUSE OF COMMONS ON THE PHARMACY BILL.

Thursday, June 12.

Mr. JACOB BELL moved that the House resolve itself into a committee to consider the propriety of granting permission to bring in a Bill to regulate the qualifications of Pharmaceutical Chemists, and for other purposes in connection with the practice of Pharmacy.

Mr. HENLEY objected to the granting of this permission without due consideration, and an explanation of the nature of the Bill. It might injure a numerous and useful class of tradesmen, and notice ought to be given to the parties concerned in case they might object to the Bill. The rules of the House required that Bills affecting trade should pass through a committee of the whole House before the first reading, and if such Bills were to be hurried through at a late hour of the night without discussion this object would be frustrated.

Mr. BELL explained that the Bill was supported by the parties who would be affected by it, and that it contained a provision exempting all persons already in business from any injurious interference.

Mr. HENLEY.—Then it appears to me to be a Bill to create a monopoly in favour of ignorance.

Leave was granted to bring in the Bill.

Friday, June 13.

The Pharmacy Bill was read the first time,

Wednesday, July 2.

Mr. JACOB BELL moved the second reading of this Bill, the object of which was to improve the qualifications of Pharmaceutical Chemists, and to establish the principle that all those who compounded the prescriptions of Medical men should be educated, and should pass an examination. If it were necessary for Physicians to pass an examination before they were permitted to practise, it was of course of equal importance that the persons who furnished the remedies they prescribed should be able strictly to obey the directions of the Physicians. This principle was not new: it was recognized more than 200 years ago. The first incorporation of Apothecaries took place in the year 1617, that body then holding the position which Pharmaceutical Chemists occupied at the present day. The number then incorporated was 114, that being the number of the Physicians at that time in practice. In 1694 their growing importance was shown by their being exempted from serving on juries. About the year 1700 they found it necessary to adopt more stringent measures for enforcing education, and restraining incompetent persons. In 1748 a new Charter of Incorporation was granted to them, giving power to examiners to go into shops and examine drugs. In 1794, various abuses having arisen, an association of Apothecaries was formed, meetings were held, and a house was taken in Bloomsbury Square, for the purpose of taking measures to procure the passing of a law to reform the abuses then prevalent. That association only continued for a year or two. The most important era in the history of the Apothecaries, was in 1815. For three years previously to that time, the profession had been in a state of excitement on the subject, and in 1815, an Act was passed, called the Apothecaries' Act, which, to a certain extent, answered the desired object, although it contained exemptions which in some degree diminished its efficacy. By this time, the Chemists and Druggists had increased so much in numbers, and acquired so much influence, that it was impossible to bring the Bill through the House without some compromise. A clause in that Bill, therefore, exempted Chemists and Druggists from its operation. The examination of the Apothecaries' Company was a general one, and comprehended medical practice in all its branches. Up to the present time, the Apothecaries, who had now become general practitioners, had been gradually receding from Pharmacy, and had become more identified with medicine and surgery, while the Chemists and Druggists had taken the place which had been left vacant by the Apothecaries. If, therefore, enactments for regulating the qualifications of Apothecaries were necessary when they were the regular vendors and dispensers of medicine, similar regulations were equally necessary for those who now performed the same functions under the name of Chemists and Druggists. In 1834 a Parliamentary committee was appointed to inquire into the laws which

regulated the medical profession. Since that time, nine Bills had been introduced for the regulation of the profession. Some of these Bills had proposed to affect Chemists and Druggists by their provisions, the object being to provide for an education and examination of the dispensers of medicine which should make them as competent to perform their duties as were the prescribers of medicine to perform theirs. But the most determined opposition had been made to these Bills by the Chemists and Druggists, because it was proposed to impose severe restrictions upon them, and place them under the Apothecaries' Company for examination. It was not to be supposed that the Chemists and Druggists would consent to be placed under the jurisdiction of the Apothecaries' Company. The Apothecaries had not been subjected to extraneous jurisdiction, and the Chemists asserted their right to independence. They had no objection to the improvement of the education of the body, but they opposed the Bills that referred them to the Hall for their diplomas. The Hon. Member for Kinsale (Mr. Hawes) had brought in a Bill in 1840, which had been opposed for the reasons before stated, on which he withdrew the Bill and brought in another, in which no allusion was made to Chemists. This they considered was adding insult to injury, as it did not even recognize their existence. But they were told that the management of the affairs of their body could not be entrusted to themselves, because they were not united and incorporated. They had no representative organization. They then organized themselves into a body, and in 1843 obtained a Royal Charter of Incorporation. That body had since that time been in active operation, and had effected considerable good. The Pharmaceutical Chemists of this country were still far behind those of France and Germany in point of education; but if the present movement should extend the powers of the Society, there was no reason to doubt that in the course of ten or twenty years, the Pharmaceutical Chemists of Great Britain would be superior to those of any other country. At present, any person, however ignorant, might call himself a Chemist, and dispense medicines, and, though the Pharmaceutical Society had instituted an examination, and taken all the pains they could to improve education, yet all were not willing to submit to an examination, nor to go through the drudgery, expense, and delay of qualifying themselves, seeing that even if they failed in their examination, and were utterly ignorant of the very elements of the science, they might snap their fingers at the examiners, and set up in business the next day. The necessity of compulsory examinations was pointed out in strong terms by the late Sir Astley Cooper, in his evidence before the Parliamentary Committee in 1834. Having replied to the other questions, and being asked whether he had any other remark to make, he said: "Nothing occurs to me at the present moment, but the necessity of enforcing examinations. If examinations are not enforced, the profession will never be a profession of much usefulness. The Apothecaries' Company have done infinite service to this country, by getting their Bill enacted. I do not mean to say that there may not be faults in the Bill: I scarcely know it further than by its defects. But when I began to teach the profession, I used to lament that there was no enforcing examination; education was left to accident, and the result was, that it was difficult to make the pupils attend with any degree of regularity. But as soon as the Apothecaries' Bill was passed, all began to feel, that by being idle, they might be a disgrace to themselves and their families, and then they studied intensely, and I do very much attribute to the Apothecaries' Bill, the great improvement the general practitioner has undergone in the last eighteen or twenty years." The object of the present Bill was, not to give a medical character to the body, but to make it strictly Pharmaceutical. The Honourable Member for Oxfordshire objected to the Bill in the first instance, on the ground that it would interfere with a large class of tradesmen, and might seriously injure individuals who had a vested interest in the trade, and the Hon. Member said further that the Bill was to grant a monopoly of a trade in favour of particular persons. He hoped he should be able to show that the Bill was so framed as to steer between these two rocks. It was not so stringent in its provisions as any of the Medical or Pharmacy Bills hitherto introduced. It did not propose a penalty upon the person who sold an ounce of Epsom salts, or an ounce of senna, it only imposed a penalty upon persons who should deceive the public by assuming a name that did not belong to them. The Bill would not be retrospective in its operation, for after a man had commenced business, it would be unjust for the law to step in and prevent him from obtaining his daily bread. Any improvement in the qualifications of such a body must be gradual. What Parliament could do, was to prevent the evil from going any further, and as each individual went off the stage, his place would be supplied by one who had received a suitable education. By this means, in about ten or twenty years, a great

improvement would be visible. It was not the year 1851 they were legislating for, but 1860 or 1870, and by that time, he (Mr. Bell) expected to see a great improvement manifest. The Bill might not be perfect, and certain amendments might be introduced in committee. It was the object of the Bill to effect what Parliament had been for many years endeavouring to carry out, but which had been frustrated for want of the co-operation of the parties concerned. It was only by the united efforts of that House with the parties concerned, that the desired object could be effected. He was told there was not much chance of passing this Bill, because it was connected with the medical profession. He had also been told that the entire profession ought to be legislated for in one measure. But it was because all Bills comprehending the regulation of the entire profession had always been opposed, that care had been taken to keep the present Bill distinct and isolated. He hoped that it would pass without much difficulty, and he deprecated its postponement to another session, from which great mischief would arise. If the Bill were to become the law of the land at all, the sooner it passed, and the sooner the educational improvement commenced which it was the design of this Bill to secure, the better it would be for the public. It was said that a Bill of this sort ought to emanate from the Home Office. Nothing would have induced him to bring forward a measure on this subject if Her Majesty's Ministers could have been persuaded to undertake it. But during the last six or eight years, numerous memorials to the Secretary of State for the Home Department, and petitions to that House, had been presented from Chemists and Druggists in all parts of the kingdom, praying for such a Bill. In the year 1847, 298 petitions had been presented to that House, containing 10,850 signatures in favour of such a Bill. He had now introduced it, with the permission of the Secretary of State, but if it were objected that it ought not to be in private hands, he should be glad to hand it over to the Home Secretary, who, if he would pass either that Bill or any Bill having the same tendency, would confer a great benefit on the public and the profession. He therefore moved that the Bill be read a second time.

Mr. HUME said, that when the House had had before it for the last twenty years one Bill after another legislating for the medical profession, he had not much faith in the success of any measure professing to regulate that profession. This and preceding Governments had found difficulty enough in dealing with the three medical bodies already in existence—the College of Physicians, the College of Surgeons, and the Apothecaries Company—and now it was proposed to add another incorporated body to the number. The Chemists and Druggists were exempted, by their own request, from the provisions of the Apothecaries Act of 1815. The Hon. Gentleman said that the Apothecaries' Company had gone to another sphere, and that they had become Medical Practitioners; but, in his opinion, the duty proposed to be devolved upon this Pharmaceutical body ought to be the duty of the Apothecaries' Company. He wished to know whether any inquiry had been made by the Government, of the three established bodies to know whether the duties proposed to be given to the new body could or ought to be performed by any of them? It appeared to him that the addition of a fourth Parliamentary body of medical men, invested with a monopoly in its particular business, would only complicate the difficulties of the subject, and interfere with that general measure which it was so essential to have enacted for the regulation of the Medical and Surgical profession at large. The Chemists and Druggists were, doubtless, a very valuable set of men, and ought to be properly educated, but it was quite undesirable to remove them from the sphere to which they properly appertained, and in which their usefulness developed itself.

Mr. BERNAL said, the Hon. Member for Montrose seemed unaware of that progress of public opinion which imperatively demanded that the class of men practising the business of Chemist and Druggist should be greatly elevated in the scale of science and knowledge. At present he was afraid there were but too many persons employed as Chemists' Assistants who did not comprehend the difference between oxalic acid and Epsom salts, and to whom the refinements of iodine, of aconite, and other developments of recent science, were altogether unknown. He had not seen a petition against the provisions of the measure. But if there were objections, they might be remedied in committee. Was his hon. friend (Mr. Hume) aware of the good done by the Pharmaceutical Society, which comprised many most distinguished men? Was it right that any ignorant man should be allowed to write up over his door, "Chemist and Druggist," and then sell iodine and all those medicines emanating from a high order of chemistry? He asked, did not a Chemist follow a profession the most useful to the human race? and had he not oftentimes the lives of human

beings in his hands? And did it not often happen that the dispensation of the most dangerous drugs were entrusted to the hands of a silly uneducated boy? The Bill was clothed with that appearance of justice and equity which entitled it to the favourable consideration of the House. It had nothing of monopoly in it, and provided as much as possible against improper interference with other trades.

Mr. HENLEY considered that the Bill in its present shape would not effect the object contemplated. It was very curiously drawn. The hon. gentleman (Mr. Bell) disclaimed any wish to turn Chemists into Apothecaries, but the examination he proposed seemed very likely to confuse the distinction between the two professions. There was a three-fold definition of the parties with whom the Bill meant to deal. What was meant by a Pharmaceutical Chemist? He confessed he did not understand the meaning of that high-sounding term. As the Bill enacted penalties, it was most desirable to have the classes defined to whom these penalties would apply.

Mr. BELL explained. They were different names for the same class.

Mr. HENLEY.—In that case the three-fold designation in the Bill only encumbered it, and at all events there must be an interpretation clause. It would be most difficult to exclude from the penalties of the measure, a useful class of general dealers in small towns, who sold salts, turpentine, saltpetre, &c. There was no provision against the sale of patent medicines, or proprietary medicines of any kind, however deleterious their materials might notoriously be. The real state of the case, was, that a Society set up about seven years ago by Royal Charter, induced many Chemists to pay two guineas a year for a fine label, which they put in their window, with the hard words "Pharmaceutical Chemists" upon it; but he believed the bubble had burst, and that the same importance was not attached to the richly-framed label as the poor and ignorant were at first inclined to bestow. People now went for their drugs to some honest respectable tradesman whom they were accustomed to trust, and had lost faith in these gaudy labels, which were nothing better than show advertisements. Nor did it appear that there had been any useful examination instituted by this Pharmaceutical Society, the state of which, he believed, required some measure like the present to prop it up. He opposed the second reading.

Sir G. GREY said, he thought what had taken place with regard to this Bill would convince the Honourable Gentleman that he was rather too sanguine in supposing that the Bill would give general satisfaction. He had intimated to him privately that there was no chance of passing it this session. It was a Bill that ought to be before the public a considerable time before he could ask them to agree to it. He thought also this branch of the subject ought not to be considered except in connexion with the medical question generally, and he felt very strong objections to creating in this body a monopoly, giving them an exclusive right to determine who should, and who should not, be Dispensing Chemists. To the first part of the Bill he did not see any material objection. So far as power might be required for the purpose of appointing examiners, and granting certificates, he was not aware that there was any objection if that were not followed by a monopoly. If, as he had learned, the Hon. Gentleman proposed to make some extensive alterations in the Bill, he should have no objection to its being read a second time *pro forma*, provided it was understood that it should not be proceeded with any further this session.

Mr. CARDWELL approved of the Bill, but recommended the Hon. Gentleman to assent to this arrangement, or to move for a Select Committee to investigate the subject.

Mr. EWART was quite as much an advocate for some comprehensive measure on this subject as the Hon. Member for Montrose, but he felt that, in default of a general measure, a special measure that was likely to do good should not be rejected. Undoubtedly, however, the provisions of the Bill should be thoroughly investigated. He understood the term "Pharmaceutical Chemist," which the hon. gentleman opposite (Mr. Henley) affected not to understand, to mean one who applied chemistry to the remedies used for the cure of disease; and he begged to refer the hon. gentleman to Scapula's *Lexicon*, if he were desirous of investigating the etymology of the word. (A laugh). There had of late years been a general resort to the examination of candidates on the part of the learned professions, and he considered the Bill before them to be a step in the right direction.

Mr. BELL consented to adopt the suggestion which had been made, and to have the Bill now read *pro forma* with the purpose of introducing such amendments as had been and might be suggested.

The Bill was then read a second time.

Friday, July 4.

Mr. WAKLEY said the Pharmacy Bill had been read a second time on the understanding that it would go into Committee on Wednesday *pro formâ*, in order that the Bill should be printed, and that then it should not be proceeded with during the present session. He understood that the College of Physicians and the College of Surgeons had no objection to the Bill, and that the Apothecaries' Company had only one objection to it. Several thousand Chemists and Druggists were in favour of the Bill, and it received no opposition from the members of the medical profession. Under these circumstances, he wished to know whether the Bill could not be proceeded with, and become law, during the present session?

SIR G. GREY.—The Hon. Member (Mr. J. Bell) who had charge of the Bill, wished to make alterations in it, and after the Bill, with those alterations was printed, it would be ascertained whether he was right or not in saying that the Bill would give general satisfaction. From what took place on Wednesday, he thought that objections would be made to the Bill, but if no one opposed it, there could be no objection to its passing this session.

Friday, July 9.

Mr. J. BELL moved that the House go into committee on the Pharmacy Bill for the purpose of introducing certain amendments.

Mr. HENLEY stated, that the right hon. gentleman the Secretary for the Home Department had given his consent to the second reading of the Bill on the understanding that it was not to be pressed this year.

Mr. BELL replied that he had assented to the understanding, and was bound strictly to carry it out. But, in case the House should find the Bill as amended free from objections, he should leave it in the hands of the House.

The House then went into committee, and the amendments were inserted.

Friday, July 11.

NOTICES OF MOTIONS.

Mr. WAKLEY—After the order of the day has been read, for a Committee of the whole House upon the Pharmacy Bill, to move, That Mr. Speaker do leave the Chair in order that the Bill may proceed during the present session.

Mr. LACY—In Committee on Pharmacy Bill, to move the following clause:—

That it shall not be lawful for any person to vend, send out, or deliver any lotion, liniment, or embrocation, or any other liquid medicine or drug not intended to be taken inwardly, or any laudanum or other liquid poison, or any other liquid medicine or drug intended to be taken as drops, or in small doses, in some vehicle, in any other than square or polygonal sided bottles; and that it shall not be lawful to vend, send out, or deliver any medicine to be taken by way of draught in any other than in round or cylindrical or in oval shaped bottles.

Wednesday, July 16.

Mr. WAKLEY moved that the House should go into Committee on the Pharmacy Bill. The Bill had been read a second time on the understanding that it was not to be passed this session. On Friday se'nnight he had put a question to the Secretary for the Home Department whether, if all objection were withdrawn by other parties, the Bill would be allowed by the Government to proceed. The reply of the Right Hon. Gentleman was, that if other parties offered no opposition the Government would offer none. The Hon. Member for Oxfordshire, however, had frankly stated his objections; and, finding that there were still such objections, he (Mr. Wakley) would not press the Bill further this session. The measure was almost the first brick in the fabric of medical reform. The Members of that House, however, he found, had no taste for physic; but he hoped that next session the Bill would be taken into consideration in the spirit which had at present been shown to exist, because the House might be assured that they could not legislate on the subject without rendering great service to the public, whose interest it was to have men, highly educated and thoroughly acquainted with science, introduced into all parts of the kingdom. With respect to the competence of the Pharmaceutical Society for the duty which it was proposed to devolve upon it, he could say that he had not heard complaints made of that Society, which had been incorporated for above seven years. It was disheartening to the profession that more than thirty years should have elapsed since the subject of medical reform was mooted, and yet not a single measure had been enacted by Parliament to meet the necessities of the case.

Mr. HENLEY thought the Hon. Gentleman had treated the House with some injustice when he accused them of having a very great distaste for physic; for they wished to leave open the trade in physic, which the Hon. Member sought to restrict. He (Mr. Henley) viewed the Bill as dealing with one part only of a large and difficult subject; and he thought that more inquiry was necessary. The Society to which reference had been made might be well adapted for its purpose, but the House had no evidence on that point. The Bill would give the Society great power; and the proper course, he thought, would be for the Hon. Member early next session to move the appointment of a Committee with the view of procuring further information on the subject.

Mr. J. BELL had no objection to the proposed plan of appointing a Committee, and he looked forward to meeting the question in that way when Parliament assembled next session. Feeling that he was bound in honour not to press forward the Bill during the present session, on account of the understanding entered into on the second reading, he had adhered to the spirit of that understanding. At the same time, if all objections had been withdrawn and the House had given assent, he should have been glad to proceed with the Bill at once. He regretted the delay because, even if the Bill had passed during this session, several years must elapse before it would come into complete operation. Its effects would be so gradual as not to injure anyone. It was not, as the Hon. Member for Oxfordshire supposed, intended to restrict the sale of medicine, but to raise the qualifications of the persons engaged in that business. He was particularly desirous not to entangle this Bill with the general question of medical reform. He had watched the progress of the medical reform Bills which had been brought in and thrown out during the last sixteen or twenty years, and felt certain that another measure of that comprehensive description would share the same fate. He therefore thought each branch of the subject should be dealt with separately.

The order for going into Committee on the Bill was then discharged.

PETITIONS PRESENTED IN FAVOUR OF THE BILL.

N.B. The figures in brackets denote the number of Petitions—M. Medical Practitioners—C. Chemists—P. Public.

Abingdon (1) C.	Cardiff (1) C.	Fakenham (1) C.
Ashburton (1) P.	Carlisle (3) M. C. P.	Falkingham (1) C.
Ashby-de-la-Zouch (3) M. C. P.	Carnarvon (3) M. P. C.	Falmouth (1) C.
Audlem (1) P.	Cranbrook (1) C.	Forres (1) C.
Ayleham (1) C.	Chawbeut (1) C.	Foulsham (1) C.
Bakewell (3) M. C. P.	Chelmsford (1) C.	Gloucester (3) M. C. P.
Baldock (3) M. P. C.	Cheltenham (2) M. C.	Gravesend (1) C.
Barnet (1) C.	Chertsey (1) P.	Great Dalby (1) P.
Barnstaple (3) M. C. P.	Chester (3) M. C. P.	Great Grimsby (1) C.
Bath (3) M. C. P.	Christchurch, Surrey (1) P.	Great Yarmouth (1) C.]
Battle (1) C.	Colchester (1) C.	Godalming (1) P.
Beaminster (1) C.	Collumpton (1) P.	Goole (3) M. C. P.
Bevington (1) P.	Congleton (3) M. C. P.	Gosport (1) C.
Belper (1) C.	Crewkerne (2) C. P.	Guildford (4) M. C. P.
Berkhampstead (2) C. P.	Cromer (1) C.	Halesworth (3) M. C. P.
Berwick-upon-Tweed (1) C.	Croydon (3) M. C. P.	Halifax (1) C.
Bicester (3) M. P. C.	Darlington (1) C.	Haistead (1) C.
Birkenhead (3) M. C. P.	Dartford (1) C.	Hampton (1) P.
Birmingham (3) M. C. P.	Deptford (1) C.	Hanley and Shelton (1) C.
Bloxham (1) M.	Derby (4) M. P. C.	Harleston (1) C.
Bolton-le-Moors (3) M. C. P.	Devonport (1) C.	Hartlepool (1) P.
Boxham (1) C.	Dewsbury (1) C.	Harwich (1) P.
Bradford, Wilts (4) M. C. P.	Diss (3) M. C. P.	Haxford near Beekham (1) C.
Brecon (2) M. C.	Doncaster (3) M. C. P.	Hingham (1) C.
Bridgewater (2) M. C.	Dorchester (1) C.	Hitchin (2) M. C.
Bridport (3) M. C. P.	Dover (1) C.	Hogsthorpe (1) M.
Brighton (3) M. C. P.	Dudley (1) C.	Holt (3) M. C. P.
Bristol and Clifton (3) M. C. P.	Durham (3) M. C. P.	Holywell (3) M. C. P.
Bromyard (3) M. C. P.	Dunfermline (3) M. C. P.	Horncastle (1) C.
Burnham (1) C.	East Dereham (1) C.	Horsham (1) C.
Burnham Market (1) C.	East Grinstead (1) C.	Hewden (1) C.
Burnley (3) M. C. P.	East Stonehouse (1) C.	Huddersfield (1) C.
Burrough (1) P.	Edinburgh (1) C.	Ilfracombe (3) M. C. P.
Burrough-on-the-Hill (1) M.	Egremont (1) P.	Ipswich (1) C.
Burslem (3) M. C. P.	Elgin (3) M. C. P.	Isle of Wight (2) M. C.
Burslem and Tunstall (1) C.	Eye (2) M. C.	Kingston-upon-Thames (1) C.
Bury St. Edmunds (1) C.	Exeter (2) C., (1) M.	Kingston-upon-Hull (1) C.
Calne (1) C.	Exmouth (1) C.	Landport (2) C.

Leamington (3) M. C. P.
 Ledbury (3) M. C. P.
 Leeds (3) M. C. P.
 Leicester (1) C.
 Leominster (1) C.
 Lewisham (2) C. P.
 Liskard (3) C. P.
 Liverpool (6) M. C. P.
 Llandillo (3) M. C. P.
 London (1) C.
 London (7) C., (9) M., (5) P.
 Baywater (1) P.
 Bethnal Green (2) P. C.
 Bishopsgate (2) C. P.
 Brewer Street (1) P.
 Camberwell, Walworth, and
 Peckham (4) P., (1) C.
 Camden Town (1) C.
 Chelsea (1) P.
 Chelsea and Brompton (2) P.,
 (1) M., (1) C.
 Christ Church District (2) P. C.
 Clapham (1) M.
 Clerkenwell (6) C. P.
 Commercial Road (1) C.
 Edgware Road and Lisson
 Grove (2) M. P.
 Finchchurch Street (1) P.
 Finsbury (2) C. P.
 Hackney (2) P. C.
 Hampstead (4) M. C. P.
 Holborn (1) C.
 Hoxton (3) C. P.
 Hoxton New Town (2) P. C.
 Hoxton Old Town (3) P.
 Islington (2) P.
 Islington (4) C. P.
 King William Street (1) P.
 Kentish Town (2) M. P.
 Knightsbridge (1) P.
 Leadenhall Street (1) P.
 Limehouse (2) C. P.
 Ludgate Hill (1) C.
 May Fair (1) P.
 New North Road (1) P.
 Nottingham (2) P.
 Oxford Street (1) P.
 Paddington (2) P.
 Paddington and Marylebone
 (11) M. C. P.
 Pentonville (1) P.
 Pharmaceutical Society, Peti-
 tion signed at the Anni-
 versary (56 Signatures)
 Pharmaceutical Society, Stu-
 dents in the Laboratory (1)
 Piccadilly (1) P.
 Pimlico (3) P.
 Portman Square (1) P.
 Putney and Fulham (3) M.
 C. P.
 Regent's Park (1) P.
 Shadwell (1) C.
 Shoreditch (1) C.

London—continued.
 Sloane Street, (1) C. (1) P.
 Spitalfields (2) P. C.
 Southwark (1) C., (2) P.
 St. George's, Bloomsb. (2) P.
 St. George, Hanover Square
 (2) C., (5) P.
 St. Giles & St. George (2) P.
 St. James (3) C., (2) P.
 St. John's Wood (1) C.
 St. Marylebone, St. James,
 and other Parishes (1) P.
 St. Pancras (1) P.
 St. Paul's, Shadwell (1) P.
 Stepney (3) C. P.
 Strand (2) C., (8) P., (1) M.
 Temple and Fleet Street (1) P.
 Threadneedle Street (1) P.
 Tottenham Court Road (2) P.
 Westminster (2) P., (1) C.
 Whitechapel (2) C.
 York St., Westminster (1) P.
 Long Sutton (3) M. C. P.
 Lutterworth (1) C.
 Lyme Regis (3) M. C. P.
 Lyndhurst (1) C.
 Manchester (2) M. C.
 Market Harboro' (3) M. C. P.
 Melrose (1) M.
 Melton Mowbray (3) M. C. P.
 Merthyr Tydvil (1) M.
 Middlesborough (1) C.
 Mold (1) M.
 Morpeth (2) M. C.
 Newark-upon-Trent (1)
 New Buckenham (1) C.
 Newcastle-under-Lyne (2) M. C.
 Newcastle-upon-Tyne (3) M.
 C. P.
 North Walsham (1) C.
 Norwich (3) M. C. P.
 Nottingham, Town and County
 (3) M. C. P.
 Otley (2) M. C.
 Ottishall (1) C.
 Oxford (3) M. C. P.
 Peterborough (3) M. C. P.
 Portsmouth (1) C.
 Plymouth (1) C.
 Preston (3) M. C. P.
 Ramsgate (1) C.
 Reading (1) C.
 Reigate (2) P. C.
 Richmond and Twickenham
 (3) M. C. P.
 Richmond, York (3) M. C. P.
 Ripon (1) C.
 Rochdale (3) M. C. P.
 Rochester (1) C.
 Rugby (1) C.
 Ruthin (1) M.
 Sandgate (1) M. C.
 Scarborough (2) M. C.

Selby (1) C.
 Selwood (1) C.
 Shaftesbury (3) M. C. P.
 Sheffield (5) M. C. P.
 Shepton Mallet (1) C.
 Sherborne (1) C.
 Slough (1) P.
 Somerby (2) M. P.
 South Shields (3) M. C. P.
 Southampton (1) C.
 Sowerby Bridge (3) M. C. P.
 Stafford (3) M. C. P.
 Stalybridge (3) M. C. P.
 Stamford (1) C.
 Stockport (1) C., (1) M.
 Stockton-on-Tees (1) C.
 Stoke-upon-Trent, Fenton and
 Longton (1) C.
 Stourbridge (1) M., (1) C.
 Stowmarket (3) M. C. P.
 Stratford-on-Avon (2) M. C.
 Stratton, St. Mary (1) C.
 Swansea (2) M. C.
 Tavistock (1) C.
 Teignmouth (2) M. C.
 Tenterden (1) C.
 Thirsk (2) M. C.
 Thorney (1) C.
 Thorne Satchville (1) P.
 Tickhill (2) C. P.
 Tonbridge (1) C.
 Tonbridge, Wilts. (1) C.
 Torquay (1) C.
 Torre (2) M. P.
 Truro (1) C.
 Tunbridge Wells (1) C.
 Twyford (2) M. P.
 Uttoxeter (3) M. C. P.
 Uxbridge (2) M. C.
 Wakefield (1) C.
 Walsall (1) C.
 Waltham (1) C.
 Warrington (1) C.
 Warwick (2) M. C.
 Watton (1) P.
 Watton (1) C.
 Wednesbury (3) M. C. P.
 Wellington (1) C.
 Westbury (1) C.
 Wetherby (1) P.
 Weymouth (3) M. C. P.
 Wickham Market (1) C.
 Wigan (3) M. C. P.
 Wigan (3) M. C. P.
 Windsor, Eton, and Slough
 (1) C.
 Wolverhampton (1) C.
 Woodbridge (2) C. P.
 Woolwich (1) C.
 Wootton-under-Edge (1) C.
 Worcester (4) M. C. P.
 Wymondham (1) C.
 York (3) M. C. P.

TOTAL NUMBER OF PETITIONS 558—SIGNATURES 15,264.

PETITIONS AGAINST THE PHARMACY BILL.

THE PETITION OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH,

(Presented by Sir W. Gibson Craig)

Humbly sheweth,

That your petitioners have seen a copy of a Bill now under consideration of your Honourable House, for regulating the qualifications of Pharmaceutical Chemists, Chemists and Druggists, and Dispensing Chemists in Great Britain, the objects of which, *inter alia*, are to confer on a Pharmaceutical Society in London powers to examine, licence, and register persons thus designated, and to prosecute persons practising in any of the above capacities, or assuming any of the above titles in any part of Great Britain without being registered by them.

That this Bill appears to your petitioners to be objectionable on the following grounds:—

1. That, assuming it to be desirable that means should be provided for giving a legal status to

Chemists and Druggists who are not Medical Practitioners, it appears to your petitioners very inexpedient that this power should be conferred on any one body, and that Chemists and Druggists from every part of Great Britain should be obliged to resort to a Society in London for an examination and a qualification which can easily be had in Scotland.

2. That by the 17th and 18th clauses of the Bill it appears that, while the right of Medical Practitioners to practise Chemistry and Pharmacy is preserved, the right of assuming the title of Chemists and Druggists or any similar titles is refused to them, unless registered in terms of the Bill, and therefore subjected to the ordeal of an examination, which in their case is altogether unnecessary.*

3. That your petitioners have long possessed powers of examining in Chemistry and Pharmacy, which have been renewed and confirmed by an Act of Parliament of 1850, and a charter of Queen Victoria in the present year; and, being perfectly competent and also willing to confer qualifications in this department, separately from the qualifications they now give to their licentiates, or to combine with other competent bodies now existing in Scotland for the purpose of conferring such qualifications, if this shall be the pleasure of the Legislature, they beg to object to being superseded in these functions through the provisions of the projected Bill.

May it therefore please your Honourable House to take the premises into your consideration, and either to reject the present Bill, or so to amend it as to confer on your petitioners powers to examine and register Chemists and Druggists for every part of Great Britain.

And your petitioners will ever pray.

JAMES SYME, President.

THE HUMBLE PETITION OF THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW,
(Presented by Mr. Archibald Hastie)

Sheweth,

That a Bill is presently depending before your Honourable House "for regulating the Qualifications of Pharmaceutical Chemists, and for other purposes in Connection with the Practice of Pharmacy," to which Bill the Petitioners have to urge the following objections:

1. That the real object of this Bill, although somewhat disguised, is to constitute "The Pharmaceutical Society of Great Britain" the only medical body entitled to examine and to grant certificates to persons desirous of exercising in any part of Great Britain the business or calling of Pharmaceutical Chemists, Chemists and Druggists, or Dispensing Chemists.

2. That the granting of the exclusive licensing powers and privileges contemplated by said Bill to the promoters thereof would be to the great prejudice of many presently existing licensing bodies in England and Scotland, and in particular to the Petitioners, who have long and efficiently exercised similar powers and privileges, and which were renewed and confirmed to them by an Act of Parliament in eighteen hundred and fifty.

3. That it would be both unjust and unnecessary to compel parties resident in Scotland desirous of becoming Pharmaceutical Chemists, Chemists and Druggists, or Dispensing Chemists, to repair to London for examination and licence so long as there are properly authorized bodies in their own country ready and willing to perform that duty.

4. That, although by the seventeenth section of said Bill it is professedly declared that it is not intended to abridge or interfere in any way with the rights and privileges of the several bodies therein referred to and enumerated, yet by the eighteenth section of said Bill this non-interference clause is rendered totally inoperative and ineffectual by its being thereby declared that the persons expressly exempt from the operation of said Act shall not, in the conduct of their several professions or occupations, use or assume the only names or titles which could distinguish them, and make it known to the public that they exercised such professions or occupations.*

5. That the petitioners, the faculty of Physicians and Surgeons of Glasgow, are not even named among the parties in the seventeenth section of said Bill;† who are proposed to be exempted from its operation, and who are, notwithstanding, a body possessing the same powers and privileges in point of licensing as the Royal College of Surgeons of Edinburgh, whose rights are thereby recognised; and

6. That, in the expectation of a general measure of medical reform being introduced and carried in Parliament, it would be inexpedient to create any new body who would necessarily require to concur in such measure, the parties presently interested being already more than sufficiently numerous and antagonistic to render the carrying of such very desirable measure one of great difficulty.

But, if it does seem desirable to the Legislature that mere Dispensers of Medicines should be licensed as such separately from possessing qualifications of a higher order entitling them to prescribe, of which the present licensing bodies in England and Scotland are the legally appointed judges, then your petitioners will continue to exercise the powers already possessed by them in reference to the examination and licensing of Pharmacians, either separately, as at present, or in connection with the other licensing bodies in Scotland, such licences being declared in the Act sought to be obtained to confer equal privileges with those held by parties in possession of the licence of the Pharmaceutical Society of London intended to be constituted by the present Bill.

May it therefore please your Honourable House that the said Bill shall not pass into law; or that it shall be so modified as to confer similar powers to those contemplated in reference to the London Pharmaceutical Society on your petitioners, either singly or in connection with the other licensing bodies in Scotland, as to your Honourable House may appear for the public benefit.

And your petitioners will ever pray.

JAMES WATSON, M.D., President of the Faculty of Physicians and Surgeons of Glasgow.

* The clause to which this alludes is erased.—ED.

† The word Medical is erroneously substituted for Pharmaceutical.—ED.

‡ The 17th clause was intended to exempt ALL legally qualified Medical Practitioners from any interference, and if not sufficiently explicit, may be amended.—ED.

WE publish the following for the information of several of our correspondents who have adverted to the subject of exemption from serving on juries, &c.

A BILL, intituled "An Act to exempt Veterinary Surgeons and Professors and Teachers of Veterinary Colleges or Schools from serving on Juries and other Offices," having passed the House of Lords, was brought to the Commons on the 26th of June.

In committee, July 21st, Mr. Bouverie opposed the Bill. He said, on looking over the list of persons exempted from these offices, he found that lawyers and medical men, as well as various other persons, were exempted, and if this principle were extended indefinitely, it was impossible to say where it might end. Engineers might say that their presence at their avocations was absolutely necessary, stokers of railway companies, and many others, might say the same. He opposed any further extension of the privilege, and moved that the Chairman do leave the chair. Mr. Bass, Mr. Christy, and Mr. Newdegate supported the Bill on the ground that the parties concerned were professional men, who could not depute others to perform their duties, that the interruption occasioned by serving on juries occasioned much inconvenience and loss to their employers.

On a division the Bill was thrown out.

A BILL

(AS AMENDED IN COMMITTEE) FOR

REGULATING THE QUALIFICATIONS OF PHARMACEUTICAL CHEMISTS,

AND OTHER PURPOSES IN CONNEXION WITH PHARMACY.

(The Clauses A, B, C, and D, were added in Committee.)

WHEREAS, it is expedient for the safety of the public that persons exercising the business or calling of Pharmaceutical Chemists, in Great Britain, should possess a competent practical knowledge of Pharmaceutical and general Chemistry, and other branches of useful knowledge: And whereas, certain persons desirous of advancing Chemistry and Pharmacy, and of promoting an uniform system of educating those who should practise the same, formed themselves into a Society, called "The Pharmaceutical Society of Great Britain," which said Society was, on the eighteenth day of February, one thousand eight hundred and forty-three, incorporated by Royal Charter, whereby it was provided that the said Society should consist of Members who should be Chemists and Druggists who were or had been established on their own account at the date of the said Charter, or who should have been examined in such manner as the Council of the said Society should deem proper, or who should have been certified to be duly qualified for admission, or who should be persons elected as Superintendents by the Council of the said Society: And whereas, it is expedient to prevent ignorant and incompetent persons exercising the business or calling of Pharmaceutical Chemists, in Great Britain, and to that end it is desirable that all persons, before exercising the said business or calling, should be duly examined as to their skill and knowledge by competent persons, and that a register should be kept by some legally authorized officer, of all such persons: And whereas, for the purposes aforesaid, and for extending the benefits which have already resulted from the said Charter of Incorporation, it is desirable that additional powers should be granted for regulating the qualifications of persons who may carry on the business of Pharmaceutical Chemists, and for other purposes connected with Pharmacy: be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same,

I. That the said Charter of Incorporation, granted to the said Society on the eighteenth day of February, one thousand eight hundred and forty-three, save and except such part or parts thereof as are hereby altered, varied, or repealed, shall be and the same is hereby confirmed, and declared to be in full force and virtue, and shall be as good and effectual to all intents and purposes as if this Act had not been made.

II. The Council of the said Pharmaceutical Society shall be and the same are hereby authorized and empowered to alter and amend the byelaws of the said Society made and established under or in pursuance of the said Charter of Incorporation, and to make and establish such new or additional byelaws as they shall deem proper and necessary for the purposes contemplated by the said Charter or by

this Act; provided that all such original byelaws, and all altered, amended, or additional byelaws, shall be confirmed and approved by one of Her Majesty's principal Secretaries of State, and by a General Meeting of the Members of the said Pharmaceutical Society: Provided also, that the existing byelaws of the said Society shall continue in force until the next Annual Meeting of the said Society, to be held in the month of May, 1852.

(A.) III. That at all Meetings of the said Society at which votes shall be given for the election of officers, all Members entitled to vote may give their votes either personally, or, in cases of residence exceeding five miles from the General Post-office, Saint Martin's-le-Grand, London, by proxies authorized by writing according to the form in the schedule to this Act annexed, or in a form to the like effect under the hand of the Member of the said Society nominating such proxy, and every proposition at any such Meeting shall be determined by the majority of votes of the parties present including proxies, the Chairman of the Meeting being entitled to vote not only as a principal and proxy, but to have a casting vote if there be an equality of votes.

(B.) IV. That no person shall be entitled to vote as a proxy unless the instrument appointing such proxy have been transmitted for the prescribed period to the Registrar to be appointed under this Act, or if no period be prescribed, not less than forty-eight hours before the time appointed for holding the Meeting at which such proxy is to be used.

V. The Council of the said Pharmaceutical Society shall, within three calendar months after the passing of this Act, appoint a fit and proper person as a Registrar under this Act; and the Council of the said Society shall have the power to remove the said Registrar, or any future Registrar to be appointed under this Act, from the said office, and from time to time to appoint a new Registrar in the room of any Registrar who may die, or retire, or be removed from office as aforesaid, and also to appoint and remove from time to time a Deputy Registrar and such Clerks and other subordinate officers as may be requisite for carrying out the purposes of this Act, and also to pay suitable salaries to the said Registrar, Deputy Registrar, Clerks, and officers.

VI. The Registrar to be appointed under or by virtue of this Act shall from time to time make out a complete Register of all persons carrying on the business of or being employed as Pharmaceutical Chemists, who shall, in writing addressed to the said Registrar, desire to be entered upon the List of Pharmaceutical Chemists, and shall also furnish such evidence of their being so employed as may from time to time be required by the Council of the said Pharmaceutical Society of Great Britain.

VII. The said Registrar shall from time to time keep a proper Index of the Register, and all such other Registers and Books as may be required by the Council of the said Society, and may be necessary for giving effect to the byelaws of the said Society, and to the provisions of this Act.

VIII. The Registrar to be appointed under or by virtue of this Act shall be bound, on the application of any person paying one shilling, to certify under his hand whether or no any person whose name and address shall be furnished to him appears in the said Register, or is a Member of the Pharmaceutical Society of Great Britain, or not; and the certificate of such Registrar, signed by the said Registrar, and countersigned by the President, or two Members of the Council, of the said Society, shall, in the absence of evidence to the contrary, be sufficient evidence of the facts therein stated up to the date of the said certificate.

IX. All such persons as shall at the time of the passing of this Act be Members or Associates of the said Pharmaceutical Society of Great Britain, according to the terms of the said Charter of Incorporation, shall be entitled to be registered as Pharmaceutical Chemists, without payment of any fee; and every other person, not being a Member of the Medical Profession, or practising under a Diploma or Licence of a Medical or Surgical corporate body, who shall, within one year after the passing of this Act, present or cause to be presented to the said Registrar a certificate, and such evidence as the Council of the said Society may require, that such person did at the time of the passing of this Act exercise the business or calling of a Pharmaceutical Chemist in Great Britain, shall be entitled to be registered, without the payment of any fee; and the said Registrar is hereby required to cause the names of all such persons as shall be registered as aforesaid to be entered in a list or book provided for that purpose, as Pharmaceutical Chemists.

X. Every person who shall at the time of the passing of this Act be engaged or employed as a Student, Apprentice, or Assistant to any Pharmaceutical Chemist in

Great Britain, and who shall, within one year after the passing of this Act, present or cause to be presented to the said Registrar a certificate, and such evidence as aforesaid, that such person was at the time of the passing of this Act so engaged or employed as last aforesaid, shall be entitled to be registered without the payment of any fee; and the said Registrar is hereby required to cause the names of all such persons as shall be registered as aforesaid, to be entered in a list or book provided for that purpose as Students, Apprentices, or Assistants; and the persons so registered shall be entitled to be registered as Pharmaceutical Chemists on their commencing to exercise the business or calling of Pharmaceutical Chemists.

XI. All such persons as shall from time to time be appointed under or in pursuance of the said Charter of Incorporation, or the byelaws thereof, or under this Act, shall be, and the same are hereby declared to be fit and proper persons to conduct all such examinations as are provided for or contemplated by this Act, and shall respectively have full power and authority and are hereby authorized and empowered to examine all persons who shall present themselves for examination under the provisions of this Act, in the Latin Language and Classical Knowledge, in Botany, in Materia Medica, and in Pharmaceutical and General Chemistry and Toxicology, any or either of them, and to grant or refuse to such persons as in their discretion may seem fit, certificates of competent skill and knowledge and qualification to exercise the business or calling of Pharmaceutical Chemists, or, as the case may require, to be engaged or employed as Students, Apprentices, or Assistants respectively.

(C). XII. And to enable the said Society to provide for the Examination in Scotland of such Students, Apprentices, or Assistants in Scotland as may desire to be examined there, it shall be lawful for the Society, and they are hereby required to appoint such fit and proper persons, in Scotland, to meet at Edinburgh, and to conduct there all such Examinations as are provided for and contemplated by this Act, with such and the like powers and authorities in respect thereof as are herein conferred, and to grant to the persons to be so examined such and the like certificates as are hereinbefore specified and referred to, or to refuse the same; and all the provisions of this Act shall be equally applicable to the Examiners, Examinations, and parties examined in Scotland, as to the Examiners, Examinations, and parties examined in England.

XIII. Every such person who shall have been examined by the persons appointed as aforesaid, and shall have obtained a Certificate of Qualification from them, shall be entitled to be registered by the Registrar, according to the provisions of this Act, upon production to him of such Certificate, and upon payment of such fee as shall be appointed in pursuance of the provisions of this Act; and every such person duly registered as a Pharmaceutical Chemist, shall be eligible to be elected as a Member of the said Society; and every such person duly examined and registered as an Assistant to a Pharmaceutical Chemist, shall be eligible for admission as an Associate of the said Society; and every such person duly examined and registered as a Student or Apprentice to a Pharmaceutical Chemist, shall be eligible for admission into the said Society, according to the byelaws thereof.

XIV. Except as hereinbefore provided, no person shall be entitled to be registered under this Act unless and until he shall have obtained a Certificate of Examination as hereinbefore mentioned from the persons so appointed as aforesaid.

XV. From and after the passing of this Act it shall not be lawful for any person, not being duly registered as a Pharmaceutical Chemist, according to the provisions of this Act (except persons carrying on the said business at or before the time of the passing of this Act, and except the widows of all Pharmaceutical Chemists having in every case the assistance of a person duly qualified under this Act) to exercise the business or calling of a Pharmaceutical Chemist, in any part of Great Britain, under the name or title of Pharmaceutical Chemist, or to assume or use the name or title of Pharmaceutical Chemist, or to assume or use any other name, title, sign, token, or emblem implying that he is registered under this Act, or entitled to carry on or exercise the business or calling of a Pharmaceutical Chemist; and if any person, except the persons exempted by this Act, not being duly registered under this Act shall, after the passing of this Act, take or use the name or title of Pharmaceutical Chemist, or shall use, display, or exhibit any name, title, sign, token, or emblem implying that he is a person registered under this Act, or entitled to carry on or exercise the business or calling of a Pharmaceutical Chemist, every such person shall forfeit and pay for every such offence a sum not exceeding five pounds nor less than two pounds; and such penalty may be recovered by the

Registrar to be appointed under this Act, in the name and by the authority of the Council of the said Society, in manner following; that is to say,

In England or Wales by plaint under the provisions of any Act in force for the more easy recovery of small debts and demands:

In Scotland, by action before the Court of Session in ordinary form, or by summary action before the Sheriff of the County, or in the Royal Burghs before the Magistrate of the Burghs, where the offence may be committed or the offender resides, who upon proof of the offence or offences, either by confession of the party offending, or by the oath or affirmation of one or more credible witnesses, shall convict the offender, and find him liable in the penalty or penalties aforesaid, as also in expenses; and it shall be lawful for the Sheriff or Magistrate in pronouncing such judgment for the penalty or penalties, and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding:

Providing always, that it shall be lawful for the Sheriff or Magistrate, in the event of his dismissing the action, and assailing the defender, to find the complainer liable in expenses; and any judgment so to be pronounced by the Sheriff or Magistrate, in such summary application, shall be final and conclusive, and not subject to review by advocacy, suspension, reduction, or otherwise.

XVI. Provided always, That no action or other proceeding for any offence under this Act shall be brought after the expiration of six months from the commission of such offence; and in every such action or proceeding the party who shall prevail shall recover his full costs of suit or of such other proceeding.

XVII. All and every sums and sum of money which shall arise from any conviction and recovery of penalties for offences incurred under this Act, shall be paid as the Lords Commissioners of Her Majesty's Treasury shall direct.

XVIII. If any Registrar under this Act shall wilfully make or cause to be made any falsification in any matters relating to any Register or Certificate aforesaid, every such offender shall be deemed guilty of a misdemeanor, and shall, on conviction thereof, be sentenced to pay a fine not exceeding twenty pounds nor less than two pounds.

XIX. If any person shall wilfully procure by any false or fraudulent means a certificate, purporting to be a certificate of registration under this Act, every such person so offending shall be adjudged guilty of a misdemeanor; and it shall be lawful for the court before whom such offender shall be tried and convicted, to sentence such offender to pay a fine not exceeding twenty pounds nor less than two pounds.

XX. Provided always, That nothing in this Act contained shall extend or be construed to extend to lessen, abridge, or defeat, or in anywise to interfere with any of the rights, authorities, privileges, and immunities heretofore vested in and exercised or enjoyed by either of the Universities of Oxford or Cambridge, the Royal Colleges of Physicians or of Surgeons of England, Scotland, or Ireland, or the Society of Apothecaries of London, or of any person or persons who may now be or hereafter may become entitled to practise as an Apothecary or Apothecaries under an Act of Parliament passed in the fifty-fifth year of his Majesty King George the Third, intituled "An Act for better regulating the Practice of Apothecaries throughout England and Wales," or any other legally qualified medical practitioners, but that the said Universities and Royal Colleges, and the said Society of Apothecaries, and all such person or persons as aforesaid, shall have, use, exercise, and enjoy all such rights, authorities, privileges, and immunities as aforesaid, in as full, ample, and beneficial a manner to all intents and purposes as they might have done in case this Act had never been passed.

XXI. Provided always, That nothing in this Act contained shall extend or be construed to extend to affect or in anywise interfere with the trades, businesses, or occupations of drysalers, vendors of drugs or chemicals used for other than medicinal purposes, or makers, compounders, or vendors of any stamped, patent, or proprietary medicines, or of horse or cattle medicines, but that all such persons respectively shall be entitled to carry on their respective trades, businesses, or occupations in the same manner to all intents and purposes as they respectively might have done in case this Act had never been passed, subject to the condition that in so doing no such person shall assume the name or title of a Pharmaceutical Chemist, or use, display, or exhibit any name, sign, token, or emblem, implying that he is a person registered under this Act.

(D.) XXII. That the term and expression "Pharmaceutical Chemists," used and

employed in this Act, shall be construed to and shall comprise and include Chemists and Druggists, Dispensing Chemists, and every other name denoting a vendor and dispenser of medicines.

SCHEDULE REFERRED TO BY THE FOREGOING ACT.

A. B. one of the registered Members of the Pharmaceutical Society, doth hereby appoint C. D. of to be the proxy of the said A. B., in his absence to vote in his name at the Meeting of the Members to be held on the day of . In witness whereof the said A. B. hath hereunto set his hand the day of 18 .

ORIGINAL AND EXTRACTED ARTICLES.

ON KOKUM BUTTER, OR THE CONCRETE OIL OF MANGOSTEEN.

BY JONATHAN PEREIRA, M.D., F.R.S.

I HAVE recently received from my friend Dr. Frampton, a specimen of Kokum Butter, or the Concrete Oil of Mangosteen, accompanied with the following extract from a note written by Colonel Le Messurier, by whom the oil was brought from India:—

"The Indian name of mangosteen oil is *kōkūm*. You will, I think, find this oil of much use in all cases of chapped skin, hands, face, &c. Either use it scraping a little on to hot water, or by taking the powder and rubbing it on the hands or face.

"The preparation is made from the cold fruit, which is found abundantly on the slopes of the mountains on the western side of India, from 100 miles of Bombay to, I believe, Cape Cormorin."

As very few notices of this oil (or rather vegetable butter) are to be found in any works, a few observations concerning it may not, perhaps, be uninteresting to the readers of the Pharmaceutical Journal.

The mangosteen referred to by Colonel Messurier as yielding this oil, is the *Garcinia purpurea* of Roxburgh, who does not, however, notice the oil. He observes that, "Of this evidently very distinct species, I have only specimens with leaves, and the ripe fruit sent by Dr. Berry under the name of *mate mangostan*, which is found in gardens only, and supposed to have been originally brought from the Eastern Archipelago. It differs from every other species in the whole fruit, which is about the size of a small orange, being throughout of a deep purple colour, even the pulpy aril of the seeds."

In Graham's *Catalogue of the Plants growing in Bombay and its vicinity* (published at Bombay 1839) there is the following account of the tree and oil:—

"*GARCINIA PURPUREA*. ROX. Flora, 2, p. 624. Wright's Illust., No. 8, p. 125. Rumph. Amb. 3, t. 32.

"The *kōkūm*.—*Brindao* of the Portuguese; a very elegant tree; head generally of a conical form; branches drooping; leaves dark green, shining; fruit round and smooth, not furrowed; size of a crab-apple; when ripe of a purple colour throughout; it has an agreeable acid flavour, and is eaten by the natives. Workers in iron use the acid juice as a mordant. A concrete oil is obtained from the seeds, which is well known, and used at Goa for adulterating ghée (*Bombay Courier*, 12th June, 1830); in gardens, Bombay; pretty common in some parts of the Concan, in the ravines of Kandalla."

In the *Journal of the Asiatic Society of Bengal*, vol. ii., p. 592, for 1833, the mode of preparing the oil (which the writer calls *Kākūmb-ka-Tēl*, or *Concrete Oil of Wild Mangosteen*) is thus described:—

"The oil is extracted from the seeds by boiling. They are first exposed for some days in the sun to dry, and then pounded and boiled in water: the oil collects on the surface, and on cooling concretes into a solid cake. When purified from extraneous matter, the product is of a rather brittle quality; of a pale yellowish hue, the shade inclining to green; exceedingly mild and bland to the taste, melting in the mouth like butter, and impressing a sensation of cold on the tongue, not unlike what is experienced on allowing a particle of nitre to dissolve on the tongue. * * *

"The quantity of the concrete oil that may be obtained from the seeds may be

taken at about one-tenth. From half a pound avoirdupois, or 3,500 grains of the seeds, I obtained 360 grains of the concrete oil in a moderately pure state. The above is somewhat more than one-tenth; and with better management, the product might perhaps be greater. It requires, however, long-continued boiling to extract it, and it is still more tedious to purify it from the fibrous matter of the seeds."

The same writer also observes that,

"The concrete oil of the mangosteen might, I apprehend, be advantageously introduced into pharmaceutical preparations. It is used by the natives as a healing application. I have noticed among its sensible properties, that it impresses a sensation of cold on the tongue; from which it would appear that it powerfully absorbs heat, as several salts do in the act of dissolving. It is easy to conceive that this property may often be of general service in wounds or sores, accompanied with inflammation, which it is desirable to abate."

The specimens of kokum butter given to me by Dr. Frampton are in cylindrical masses of nearly three inches in diameter and between three and four inches long.

Kokum butter is a solid, firm, very friable substance. Between the fingers it feels greasy, somewhat like spermaceti; its colour is pale yellow; it has a faint not disagreeable odour. In appearance it has considerable resemblance to a solid fat which was brought from India some years ago under the name of *Minia Batta*, or *Stone Oil*, and which was said to be extracted by the natives of Borneo from a tree which is very abundant there (Dr. R. D. Thomson, *British Annual and Epitome of the Progress of Science*, p. 360. Lond. 1837). In odour, however, it differs from the specimen of *Minia Batta* in my possession.

The anonymous writer, in the *Bengal Journal* above quoted, has drawn attention to the difference between the melting and congealing points of kokum butter. He found that it softened at from 90° to 100°, began to separate in a semi-fluid state at 106°, was partially opaque at 116°, but had attained perfect fluidity and transparency at 120°. Its congealing point, however, he found to be 90°. Mr. Redwood, who, at my request, kindly examined this subject, writes me that this butter "melts at about 98° F., remains fluid until cooled to 75°, and when it then begins to solidify the temperature rises to 92°, at which it becomes solid."

It is very slightly soluble in rectified spirit: more so in hot than in cold spirit. Mr. Redwood found that one ounce of rectified spirit dissolved only 1.7 grs. of the butter. In ether, however, it is readily soluble: one part of the butter dissolving almost immediately in about two parts of cold ether.

Heated with oil of vitriol it yields a crimson red solution, with the evolution of sulphurous acid.

SIMILARITY IN THE MEDICAL PROPERTIES OF TWO SPECIES OF COTYLEDON.

BY MR. W. PENNEY.

It is acknowledged by botanists, that the structure of plants indicates, with more or less correctness, their properties; thus, for instance, most of the plants belonging to the natural orders Gentianaceæ, Solanaceæ, and Labiata, manifest the properties peculiar to their order, bitter, narcotic, or aromatic; plants belonging to the order Plumbaginaceæ, are all vesicating, acrid, and poisonous, whilst those classed together in the family Musaceæ, are innocuous and nutritious; yet to this general law there are some exceptions, the family Leguminosæ containing many deleterious plants with some which are quite harmless.

The properties of plants are liable also to be affected by climate and soil, as in the case of the *Enanthe crocata*, which, when growing in the neighbourhood of London, is poisonous, but when found near Edinburgh, is quite inert. The fact, however, is sufficiently general to be of the greatest use to the botanist when travelling in unexplored regions, enabling him to distinguish plants which are medicinal or alimentary, from those possessing neither medical nor dietetical properties.

As instances of the relation existing between the structure and properties of plants, which belong to the same family or genus, are valuable to the Medical Practitioner and Pharmaceutist, the following notice of two plants having similar properties, and growing in different climates, may not be altogether devoid of interest. In the *Medical Gazette* for March, 1849, Mr. Thos. Salter, of Poole, pointed out to the medical profession the beneficial effects of the *Cotyledon umbilicus** in the cure of epilepsy.

Dr. L. Pappe, of Cape Town, in his *Flora Capensis Medicæ Prodrômus*, published in 1850, thus describes a plant of the same genus—

“*Cotyledon orbiculata*, Linn. — Stem fleshy, leafless, elongated, branchy; leaves opposite, flat, obovate, spatulate, blunt, acuminate, (often) farinaceously glaucous, with a red border; flowers paniculate, nodding. This succulent shrub is common in mountainous parts. The leaves are thick, and from their shape called *varken-sooren* (pig's ears). The fresh juice is of service in epilepsy, and has been prescribed by me in the case of a young man subject to this frightful disease. Not only were the symptoms evidently diminished, but subsequent attacks were less violent. The leaves form an excellent application to hard corns, on the removal of the epidermis of the upper side of the leaf: it is left on the part for eight or ten hours, when it will be found that the juicy portion of the leaf is gone, and the corn feels soft, and may be removed with ease. It should be remarked here that *Crassula arborescens*, Willd., has the same properties.”

It would be interesting to know whether the leaves of the *Cotyledon umbilicus*, or of any other crassulaceous plant in this country, possess the same property of removing corns as this plant.

Specimens of the plants, mentioned by Dr. Pappe, in his *Prodrômus*, were sent to the Great Exhibition, and may be found in the Cape department, No. 4, Avenue M., Area 30.

TINCTURA FERRI AMMONIO-CHLORIDI.—Ph. Lond.

THE following are the formulæ for this preparation in the London Pharmacopœias for 1836 and 1851 respectively:—

For 1836.

Take of ammonio-chloride of iron, four ounces.

Proof spirit, a pint.

Dissolve the ammonio-chloride of iron in the spirit, and strain.

Mr. Phillips states, in a note, that a fluid ounce yielded by decomposition grs. 5.8 of sesquioxide of iron.

For 1851.

Take of ammonio-chloride of iron, four ounces.

Proof spirit and distilled water, of each a pint.

Dissolve and strain.

A fluid ounce of this tincture yields, on the addition of potash, grs. 5.8 of sesquioxide of iron.

It is obvious from the two notes added to these formulæ, the one on the authority of Mr. Phillips, the other on that of the College, that the strength of the preparation was intended to be the same in the two formulæ; yet the tincture prepared according to the formula of 1851, is only half the strength of that made according to the formula of 1836.

The explanation of the discrepancy is as follows: In order to prevent the deposit which occurred in the tincture of 1836, the College resolved to use a weaker spirit; and, therefore, directed *half* a pint of proof spirit and *half* a pint of water to be used as the solvent for the four ounces of the ammonio-chloride of iron; but by some accidental error the word *half* (*dimidium*) was omitted in the printing.

As we have authority for this statement, we advise Pharmaceutists to make the tincture of the strength intended by the College. It is desirable, however, that the error should be officially corrected by the publication and distribution of the *erratum* on a fly-leaf.

* This plant was figured in the *Pharmaceutical Journal* for May, 1849.

TINCTURA QUINÆ COMPOSITA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—In your review of the new London Pharmacopœia, it is stated in reference to the compound tincture of quinine, that the quinine is not perfectly soluble to the extent ordered; in proof spirit it certainly would not be soluble, and yet I have found it to be so in tincture of orange-peel, directly by means of a gentle heat, or gradually if the College directions are followed; a slight, and I think, unimportant precipitate does indeed take place; and the same occurs if acid is added, but it does not appear to be disulphate, and probably results, as Mr. Bastick supposes, from the presence of tannin. On examination the tincture of orange-peel I used, although fresh made, proved to be sub-acid, and to this I ascribe its increased solvent power. I have also been kindly allowed to test the tinctures of several other respectable Chemists, and these were in the same state, but whether arising from a natural deposit of acid in the tissues of the peel, or from the fact that the peel-cutters squeeze the fruit and so wet the peel with juice before they cut it, I have not been able to determine.

As the College of Physicians may have had an object in avoiding additional acid, it may be well to see whether this experience is confirmed before any alteration in the prescribed formula is advocated.

I remain, Sir, very respectfully yours,

Portman Street.

WALTER HEMINGWAY.

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(Continued from page 21.)

COPNEY, WILLIAM.

[Remarkably fine crystals of chrome alum, sulphate of magnesia, sulphate of copper, &c. See vol. x., p. 536.]

OWEN, CHARLES, *Edinburgh*—Manufacturer.

Specimens of pure cod-liver oil.

OYLER, S., 2, *York Street, High Street*.

Lint.

PARBOTT, W., 7, *Cleveland Street*—Producer.

Illustrations in oil and water colour, of an intense and semi-transparent brown colouring substance, derived from the smut of corn.

PATTINSON, WILLIAM WATSON, *Gateshead, Newcastle-upon-Tyne*—Manufacturer.

Large masses of crystallized alum, or sulphate of alumina and potash. Masses of pure sulphate of alumina, called in commerce concentrated alum. Specimen of bicarbonate of soda.—Manufactured at the Felling Chemical Works.

[The alum of English commerce is obtained in large quantities from manufactories at Whitby in Yorkshire. A horizontal bed of fuel, composed of brushwood or of small coal, is first made, and upon it pieces of aluminous rock are piled. The fuel being kindled, the whole mass slowly ignites. More rock is piled upon it, until, in some instances, a vast heap of inflamed material, 100 feet high and 200 feet square is raised, and continues to burn for months. The aluminous schist being thus disintegrated, and its chemical constitution changed, is lixiviated, the solution evaporated in large cisterns and purified, and sulphate of potash or ammonia is then added. The alum thus formed is dissolved, and crystallized by pouring the solution into casks made with moveable staves, called "rocheing casks." On removing the staves, an apparently solid barrel of alum is exposed. This is pierced with an instrument near the bottom, when the uncrystallized solution runs out. The mass, broken into lumps and dried, is the alum of commerce. The shipments of alum from Whitby in 1841 amounted to 3,237 tons. Alum is employed in medicine, in chemistry, and in the arts. Its most important use is as a mordant for dyers.—R. E. *Catalogue*.]

PEACOCK, G., *Southampton Docks*.

Wood preserved by a chemical process.

PICCOTTO, MOSES HAIM, 8, Crosby Square—Inventor and Manufacturer.

Specimens of decolorized and purified gum Arabic, obtained by a patent chemical process. When dissolved it forms a clear mucilage, and may be used for pharmaceutical purposes, for confectionery, for dressing silks, lace, tulle, printing, &c.

Sample of the original gum arabic from which the specimens were prepared.

[The gum is decolorized by sulphurous acid. The decolorized and purified gum is purer and whiter than the whitest Turkey gum. See *Pharmaceutical Journal* vol. ix., p. 16.—Ed.]

Specimen of ultramarine blue, for the first time manufactured in London by Hochstaetter's process.

Pure crystallized mannite, prepared in Italy, and used for medicinal purposes.

[A beautifully white and crystalline substance imported in conical masses. See *Pharmaceutical Journal*, vol. ix., pages 349 and 458.—Ed.]

PONTIFEX & WOOD, Shoe Lane, Fleet Street.

A series of chemical and metallurgic products illustrating the different processes employed for the reduction of lead from its ores, and its subsequent conversion into white lead.

Specimens of various colours and pigments, employed by artists and paper-stainers; crystals of tartaric and citric acid, sulphate of copper, &c.

PONTING, THOMAS CADBY, 32, High Street, Bristol—Inventor and Manufacturer.

Marking ink and illustrative specimen; for writing and drawing on linen, silk, and cotton, without preparation. Shaving cream. Medicinal vegetable fluid extracts made with cold water.

POUND, M., 198, Oxford Street—Importer and Manufacturer.

Imports from Calcutta :—Indian bael ; fruit of the Bengal quince. Wine of bael. Bark of the root of the bael tree.

[The Indian bael or Bengal quince is the *Ægle Marmelos* of botanists. For an account of its botanical characters and medicinal uses, see *Pharmaceutical Journal*, vol. x., p. 165.—Ed.]

Soap berries, the fruit of the Sapindus.

Jujube fruit, from the *Zyziphus vulgaris* of the south of Europe ; imported from Paris. Flaked cold cream, &c.

RICHARDSON BROTHERS and Co.—Manufacturers.

Specimens of refined saltpetre or nitrate of potash, obtained chiefly from the East Indies, and shipped from Calcutta. This substance is used in the manufacture of gunpowder, oil of vitriol, aqua fortis, and other chemical products, and also in curing provisions.

ROBERTSON, W., Banff, Scotland—Manufacturer.

Cod-liver oil, manufactured by the exhibitor. Extracted by steam-heat, and rendered almost colourless, without the use of charcoal or any other decolourising agent. Manufactured at the various fishing villages along the coast of the Moray Frith.

Skate-liver oil. Manufactured by the same process. This article is more difficult to obtain. Change of temperature scarcely affects it. By some it is preferred to cod-liver oil.

Sulphate of baryta and chloride of barium.

RUSSELL & ROBERTSON, Omoa Foundry, Holytown, Lanarkshire—Inventors.

Specimens of white-lead paint, or ceruse, yellow chromate of lead, and red dichromate of lead ; manufactured by a new process, and solely in the humid way.

The usual mode of converting blue lead into white lead, by the action of acetic acid, occupies six weeks or two months, whereas by the new process the same end is attained in one day, without endangering the health of the workmen.

SAVORY & MOORE.

Kousso, sumbul, or musk-root.

[The kousso has been imported from Aden. Sumbul or musk root is probably the produce of an umbelliferous plant of Central Asia.—Ed.]

SCHILLING & SUTTON, Brighton—Manufacturers.

Samples of soda, Seltzer, and Fachingen water.

Effervescing lemonade.

SCOTT, LANGSTON, 41, *Moorgate Street*—Manufacturer.

Large vase and small glasses, containing white or oxide of zinc.

Various small painted boards.

Patent white zinc is principally used for house-painting in lieu of white lead; but may be applied in the manufacture of crystals, paper-staining, card-enamelling, bleaching of lace, glazing of ware, for the down of artificial flowers, &c. It possesses great whiteness, gives a fresh tone to all colours, renders the paint or material prepared impervious to the action of gases, damp, &c., reflects artificial light, and preserves the materials. It is produced from spelter, and is principally imported in large flat slabs from Silesia, Galicia, and Prussia: Russia, Belgium, and China send smaller supplies; the great European dépôt is Hamburg.

SMITH, T. & H., 21, *Duke Street, Edinburgh*—Inventors and Manufacturers.

Specimens of aloine, the cathartic principle of the aloes, discovered 1850; of gallic acid, in crystals; of crystallized mannite, extracted from dandelion root; of crystallized mannite, extracted from monkshood root, discovered 1850; and of cantharidine, in crystals, the blistering principle of the Spanish fly, one part being equal to 400 parts of the powder of Spanish flies.

[Messrs. Smiths' notice of aloine will be found at p. 23 of the present volume of the *Pharmaceutical Journal*.—Ed.]

SPENCE, PETER, *Pendleton Alum Works, Manchester*—Inventor and Manufacturer.

Iron pyrites—Bisulphuret of iron, obtained in nodules interspersed in coal; its most general use is to furnish copperas or sulphate of iron by spontaneous decomposition, when spread on the ground, on what are technically called copperas beds.

Refuse pyrites, after being burned for the manufacture of sulphuric acid; used for the patent manufacture of copperas, by digesting it with sulphuric acid diluted.

Copperas crystals.

Sulphate of protoxide of iron, manufactured by patent process.

Schale, or schist, found overlying and underlying all the coal veins, and brought up in immense quantities in nearly all the coal workings, and also in the ironstone mining, the nodules of ironstone being imbedded in the shale. By a patent process, its own weight of alum can be produced, by acting on it with sulphuric acid, &c., one ton of shale, of average quality, yielding one ton of alum.

Shale, calcined for the manufacture of alum.

Shale in the process or manufacture of alum.

Alum of the first and second crystallization.

Alum finished for the market.

Patent zinc cement, or hydraulic mortar.

Specimens of the waste materials from which the cement is manufactured.

Bust composed of the cement.

The cement laid on to wall. Manufactured entirely from refuse matters.

The refuse shale, after the patent alum process, affords the silica and alumina; the refuse lime, after purifying gas for illumination, affords the calcareous ingredients, and the metallic constituent, zinc, is obtained as sulphate of zinc from the refuse of Wicklow pyrites, after its use in the manufacture of sulphuric acid. The cement is hydraulic; the affinity of oxide of zinc for oxygen prevents the oxidization of any iron, and its deleterious effect on vegetation prevents the growth of moss on its surface.

SPENCER, JOHN ALEXANDER, 9, *Westbourne Place, Hyde Park*—Manufacturer.

Case, containing chemical preparations: Naphthaline (from coal-tar); sulphate of magnesia (Epsom salts); benzoic acid (prepared by sublimation); caffeine (prepared from coffee); hydriodate of quinine; samples of cod-liver oil, 1849-50.

SPURGIN, T., *Saffron Waldon*—Producer.

Root, stem, flower, and stigmata of saffron.

SQUIRE, PETER, 277, *Oxford Street*—Inventor and Manufacturer.

A variety of Pharmaceutical extracts and preserved juices of medicinal plants. Liquor of taraxacum (dandelion). Solution of bimeconate of morphia. Fluid extract of Jamaica sarsaparilla. Cod-liver oil. Red rose leaves (dried without heat). Fine crystals of red ferro-prussiate of potash. Large perfect crystals of yellow ferro-prussiate of potash.

[The extracts, juices, and other preparations, are of first-rate quality.—Ed.]

A chloroform and ether inhaler. An apparatus for preparing infusions.

STEVENSON, WILLIAM, *Jarrow Chemical Works, South Shields*.—Manufacturer.

Crystals of Soda converted into bicarbonate of soda by exposure to carbonic acid gas.

STEPHENS, HENRY, 54, *Lower Stamford Street, Blackfriars*.—Inventor and Proprietor.

Samples of wood stained by the colour manufactured by the exhibitor, intended to show that deal or other woods may be ornamented, and the beauty of the natural graining exhibited to the best effect, thus saving the expense of painting and graining.

STUVE & Co., *Royal German Spa, Brighton*.—Manufacturers.

Artificial mineral waters, of similar composition to the springs at Spa, Pyrmont, Marienbad, Kissingen, Seltzer, Fachingen, Püllna, and Vichy. The factitious chalybeates are said to contain the carbonate of iron in solution, whereas in those imported, a part or the whole is precipitated.

STURGES, JOSEPH, *Kettering*.—Inventor.

Preparation for preserving the turnip plant from the ravages of the fly.

[The turnip plant often suffers in its earliest growth from the attacks of a small beetle, called the *Haltica nemorum*, which devours its cotyledon leaves, and thus arrests its further growth. A fine tilth and plenty of good manure generally ensure such a vigorous growth that the plant is enabled to throw out its second pair of leaves before any serious injury has been sustained.—J. W., *Catalogue*.]

A proposed remedy for the smut in wheat, and also a preventive from the ravages of the slug, grub, and wire-worm.

TENNANT, M. B., *Brighton*.

A chemical production for labels or artist's designs, a product of a silvery hue to be thrown over drawings of every description by means of chemical agency.

TENNANTS, CLOW, & Co., *Manchester*.—Manufacturers.

Sulphate of copper. Sulphate of zinc. Muriate of tin in crystals. Bichloride of tin. Nitrate of lead. Bichromate of potash. Prussiate of potash. Prussiate (red). Chlorate of potash. Garancine. Stannate of soda. Bisulphate of potash. Soda-ash. Sal-ammoniac; and pink salt.

TRUMAN, HANBURY, & BUXTON, *Winch Lane and Spitalfields*.—Producers.

Malt and hops of various qualities, exhibited in the proportions used in brewing one gallon of porter and one gallon of ale, of medium strength.

TULLOH, A., *Waltham Abbey*.—Producer.

Saltpetre, charcoal, and sulphur, used in the manufacture of gunpowder at the Royal Gunpowder Mills at Waltham Abbey.

TUSTIAN, J., *Melcombe, near Banbury*.—Manufacturer.

Petals of the red rose. Confection of the red rose. Extract of henbane.

TUSTIAN & USHER, *Melcombe, near Banbury*.—Manufacturers.

English rhubarb trimmed and untrimmed, and in powder.

[Banbury rhubarb is the produce of *Rheum Rhaponticum*. See *Pharm. Journ.*, vol. vi., pp. 73—78.—Ed.]

WARD, JOHN, *County Donegal, Ramelton*.

Specimens of kelp manufactured from sea-weed. Iodine, muriate of potash, sulphate of potash, and alkali salt; all manufactured from kelp.

WARD, SMITH, & Co., *Glasgow*.—Manufacturers.

Iodine. Muriate of potash. Sulphate of potash. Alkali salt.

WASHINGTON CHEMICAL COMPANY, *Washington, Newcastle*.

WATT, WILLIAM, *Dunchattan Chemical Works, Glasgow*.—Manufacturer.

1. Sea-weed, collected dry on the sea-shore, which is burned and converted into—2. Kelp; which, on lixiviation, is crystallized for—3. Sulphate of potash; and—4. Chloride of potassium; and—5. Carbonate of soda (crude).

The liquor is then decomposed by sulphuric acid, converting the iodides contained in the liquor into hydriodic acid; which, on oxidation and sublimation—6. Iodine, is separated from it.

WATTS, JOHN, 107, *Edgware Road*.—Manufacturer.

Daphne Mezerum, bark of the root and stem. Daphne laureola, bark of the root and stem. Cod-liver oil, made without water. Oleine of cod-liver oil. Tincture of

hops, made with home-dried hops ; and made with kiln-dried hops. Hydrochlorate of morphia, pure, in crystalline mass.

The following extracts are prepared in open vessels, at a temperature of from 110° of 130° Fahrenheit:—Acetic extract of colchicum, from the fresh corms. Extract of gentian, from the dried root. Pure aqueous extract of aloes from hepatic aloes. Extract of deadly night-shade, from the flowering plant. Extract of liquorice, from the fresh root. Extract of Turkey rhubarb, from the dried root. Extract of fetid goosefoot, from the flowering plant. Extract of hemlock, from the flowering plant. Elaterium, from the fresh fruit when nearly ripe. Inspissated oxgall. Extract of henbane, from the flowering biennial plant. Extract of white poppies, from the fresh capsules. Extract of dandelion, from the fresh roots monthly, from October to February. Powdered hemlock, the leaves of the flowering plant. Powdered fox-glove, the leaves of the flowering plant.

[An interesting series of well prepared substances.—Ed.]

WILSON, JOHN AND SON, *Glasgow*—Manufacturers.

Alum slate, raw, in the condition of bisulphuret of iron and alumina; found resting on the top of the coal in the mines. Three other specimens of the same slate, showing the progressive stages of decomposition.

Sample of the same slate calcined.

Tub of alum in the last stage of manufacture.

Crystals of alum.

Bisulphuret of iron (iron pyrites)

Iron pyrites decomposed.

Sulphate of iron (copperas) obtained from the same ore.

Sulphate of ammonia obtained from ammoniacal water, one of the products of the distillation of coal.

Naphthaline obtained from naphtha; rare, in consequence of its size and purity.

WINSOR & NEWTON, 38, *Rathbone Place, and North London Colour Works, Kentish Town*—Manufacturers.

Artists' pigments, in the raw and manufactured states, and in the various forms of preparation, for use in water-colour and oil painting, and in decorative art; including manufactures and preparations of the madder colours, cochineal, lapis lazuli, uranium, cadmium, chromium, and all the rarer kinds of chemical pigments.

Sable, badger, hog hair, and other brushes and pencils, employed in drawing and painting.

Preparations of canvas, panels, millboard, apparatus, and boxes fitted for the use of artists. Palates, and various other implements and materials employed in the fine and decorative arts.

Oxide of zinc.

WOOD & BEDFORD, *Leeds*—Manufacturers.

Specimens of the varieties of lichen used in the manufacture of cudbear, orchil, and litmus, including *Roccella fuciformis*, *Roccella tinctoria*, *Ramalina farinacea*, *Parmelia perlata*, *Parmelia tartarea*, *Umbilicaria pustulata*, and *Gyrophora murina*.

[The "Orchella weed from Angola," is marked in this collection, *Ramalina farinacea*. We believe this to be an error. The plant is a species of *Roccella*. Dr. Scouler regarded it as *R. Montagnei*, but both Sir W. Hooker and Mr. Bennett have declared it to be *R. fuciformis*. See Dr. Pereira's *Mat. Med.*, vol. ii, p. 928., 3d edit.—En].

Substances obtained from the preceding, by chemical analysis, including erythric, lecanoric, and roccellic acids, picro-erythrine, orcine, and ashes of *Roccella fuciformis*. Specimens of cudbear and orchil, and of their applications in dyeing and staining.

YOUNG, J., *Ardwick Bridge, Manchester*.—Inventor.

Mineral oil. Paraffine. Stannates, with models of apparatus.

[This mineral oil occurs as a natural spring in a coal-pit at Riddings, near Alfreton. It is used largely for machinery, the paraffine being very anti-frictional. Paraffine is one of the most remarkable of products, and has received its name from its not having chemical affinity for any substance whatever. It is the result of the distillation of tar-oils.—R. E., *Catalogue*.]

[The most interesting part of these specimens are those relating to the preparation of stannate of soda, a salt which is largely used in some of the processes of dyeing.]

Mr. Young obtains the stannate of soda by the direct action of the caustic alkali on tin ore. His process, which is patented, is thus described :

"I put a quantity of tin ore, commonly known in Cornwall by the name of *black tin*, reduced to powder, into an iron pot, along with a solution of caustic soda, and set the pot on a fire to boil. The proportions in which I use these ingredients vary with their respective qualities. If the ore contain, say 70 per cent. of tin, I use about $2\frac{1}{2}$ times its weight of caustic soda liquor, containing about 22 per cent. of soda, increasing or diminishing the proportion of liquor employed according as it is desired to produce a stannate with a greater or less excess of alkali. I keep the materials well stirred, and gradually raise the heat to between 500° and 600° Fah., at which temperature the ore is acted upon by the soda, and the tin or oxide of tin combines with the soda. The progress of the operation may be known from time to time, by taking out of the pot a small portion of the mass, and ascertaining how much of it dissolves in water, and how much of the ore remains unacted upon. The hot mass is then removed from the pot to another vessel, and set to cool ; and when cooled it is mixed with water, when any insoluble matters which may have remained in it unaffected by the caustic soda are easily separated by filtration or subsidence. The clear liquor which remains is the stannate required, which may be either employed in that state, or evaporated to dryness, or crystallized, the solid salt being dissolved as required."—ED.]

(To be continued.)

OBSERVATIONS ON ATOMIC VOLUMES AND ATOMIC WEIGHTS,

With Considerations on the Probability that certain Bodies now considered as Elementary may be decomposed.

BY PROFESSOR DUMAS.

PROFESSOR DUMAS alluded to the solubility of some substances and the insolubility of others, giving many instances of the difference of this quality in regard to solution in water, sulphuric and strong acids, and referred to Berthollet's views and experiments on this subject. The measure or volume of bodies he thought might be represented with as much facility as the weight: thus, for example, magnesia and sulphuric acid may have their volumes numerically expressed before and after combination, and also graphically by lines. Magnesia with sulphuric acid showed a certain degree of condensation, lime a greater condensation, and barytes the greatest condensation; and these he could represent and reason on as well by lines of different lengths as by figures or by words. The degree of condensation (however expressed) had also relation to the quality or degree of solubility. Thus, sulphate of magnesia was very soluble, sulphate of lime but little soluble, and the greatly condensed sulphate of baryta was insoluble. He then pursued the analogy with the chlorides, comparing the chloride of sodium with the extreme case of the chloride of silver. After graphically expressing the solubility of bases, with sulphuric acid by lines, he proceeded to show that the relative volumes of the elements chlorine, bromine, and iodine could be perfectly represented by lines equal in length. Prof. Dumas said, that when a number of metals are represented by lines, at first they seem in confusion, and it would appear like an impossibility to arrange them in a system of lines to permit their relations to appear; but when considered in relation to the substitution of one property for another, or to the substitution of one substance for another in groups, then their arrangement became easy. And here we may remark, that Prof. Dumas had not previously prepared diagrams or tables, but covered a large black board with lines, figures, and formulæ, to follow his train of reasoning—and symbols, volumes, and names were rapidly produced, and as rapidly effaced to illustrate the Professor's views of the laws of the substitution of one body for another in a compound. Prof. Dumas gave many examples of groups of bodies, such as the alkalies, earths, &c., arranged in the order of their affinities. He called attention to the Triad groups, to the intermediate body having most of its qualities intermediate with the properties of the extremes, and also that the atomic or combining number was also of the middle term, exactly half of the extremes added together; thus,

sulphur 16, selenium 40, and tellurium 64. Half of the extremes give 40, the number for the middle term. Chlorine 35, bromine 80, and iodine 125. Or the alkalies, lithia, soda, and potassa, or earths, lime, strontia, and baryta, afford, with many others, examples of this coincidence; hence the suggestion, that in a series of bodies, if the extremes were known by some law, intermediate bodies might be discovered; and in the spirit of these remarks, if bodies are to be transformed or decomposed into others the suggestion of suspicion is thrown upon the possibility of the intermediate body being composed of the extremes of the series, and transmutable changes thus hoped for. Prof. Dumas then showed that in the metals similar properties are found to those of non-metallic bodies; alluding to the possibility that metals that were similar in their relations, and which may be substituted one for the other in certain compounds, might also be found *transmutable* the one into the other. He then took up the inorganic bodies where substitutions took place, which he stated much resembled the metals. After discussing groups in triads, Prof. Dumas alluded to the ideas of the ancients of the transmutation of metals, and their desire to change lead into silver and mercury into gold; but these metals do not appear to have the requisite similar relations to render these changes possible. He then passed to the changes of other bodies, such as the transmutation of diamonds into black lead under the voltaic arc. After elaborate reasoning, and offering many analogies from the stores of chemical analysis, Prof. Dumas expressed the idea that the law of the substitution of one body for another in groups of compounds might lead to the transformation of one group into another at will; and we should endeavour to devise means to divide the molecules of one body of one of these groups into two parts, and also of a third body, and then unite them, and probably the intermediate body might be the result. In this way, if bodies of similar properties and often associated together were transmutable one into the other, then by changes portions of one might often, if not always, be associated with the other. Thus, in nature when chlorine occurred, iodine and bromine might also be found, and always would be if they were transmutable the one into the other. Cobalt is thus mysteriously associated with nickel, iron with manganese, sulphur with selenium, &c. In the arts during operations when certain radicles were produced, analogous ones were found constantly to be associated. In the distillation of brandy, oil of wine is always an associated result.

Dr. FARADAY expressed his hope that Prof. Dumas was setting Chemists in the right path; and although conversationally acquainted with the subject, yet he had been by no means prepared for the multitude of analogies pointed out.

Mr. GROVE spoke of the importance of the view; as, by knowing the extreme compounds, it might serve as a guide in experiments and as a check to the results. He adverted to the allotropic condition of substances when their principal characters were changed but their chemical qualities were unaltered; thus, carbon in the state of diamond had a change of property so complete that it had one of the properties of metals given or transferred to it by its conducting power for electricity under these conditions, and its other forms were states resistant to electric passage. He thought this fact of certain bodies having two sets of physical properties with greatly differing character, might, with this law of the substitution of one set of chemical qualities for another in a compound group, give the hope of the great realization of some of the ideas embodied in the views of the possible transformation of one body at will so as to possess the properties of others.

Prof. WILLIAMSON, Dr. ANDERSON, and Dr. GLADSTONE remarked on these analogies, and referred to the groups of bodies of similar characters, but whose history was difficult or inexplicable. Thus, the metals of the platina group of bodies, the red states of phosphorus and of sulphur, the carrying of certain of these properties into the sulphurets of phosphorus, and the unsatisfactory history of bodies like the phosphates, might be rendered clear in future researches by the ideas resulting from numerous examples of the triad groups alluded to by Prof. Dumas.—*Report of British Association in the Athenæum.*

ON DIAMAGNETISM AND MAGNE-CRYSTALLIC ACTION.

BY DR. J. TYNDALL.

ONE of the most important inquiries which at the present day occupy the attention of the student of physical science, is the relation which subsists between magnetism and diamagnetism. Are the laws which govern both forces identical? Will the

mathematical expression of the attraction in the one case be converted into that of the repulsion in the other case by a change of sign from positive to negative? To this question Plücker replies "No." His experiments have led him to the conclusion, that when the power of a magnet, which operates upon a body composed of magnetic and diamagnetic constituents, is increased, the diamagnetism of the compound mass increases in a much quicker ratio than the magnetism; that in consequence of this an indifferent body is a physical impossibility; for a body in which the respective forces might be exactly equal and apposite when excited by a magnet of a certain strength would, upon lowering the power of the magnet below this standard, be attracted—and by increasing the power of the magnet beyond this standard, be repelled. During a previous investigation, the author of the present memoir had repeated opportunities of observing phenomena exactly similar to some of those which form the premises of Plücker's conclusion; and a close study of the subject convinced him that to account for these phenomena the hypothesis of two conflicting forces in the same compound mass, the one or the other of which predominates according as the power of the magnet is increased or diminished, was by no means necessary. To fit himself for the investigation of this question, he commenced an inquiry last November into electro-magnetic attractions; one of the results of this inquiry was, that a sphere of soft iron separated from the end of a straight electro-magnet by a small fixed distance, was attracted by the latter with a force exactly proportional to the square of the exciting current. Now, this attraction is in each case the product of two factors, one of which expresses the magnetism of the magnet, and the other the magnetism of the ball; and it is easy to see, that while the attraction increases as the square of the current, the magnetism of the ball increases in the simple ratio of the current itself. Our way to a comparison of magnetic attraction and diamagnetic repulsion is now clear. We know the law according to which the magnetism of the iron ball increases, and we have only to inquire whether the diamagnetism of the bismuth ball follows the same law. The apparatus used in the former case proved, however, to be totally unfit for the measurement of diamagnetic force—the feebleness of the latter rendered a much more delicate mode of measurement necessary. The torsion balance was the instrument finally resorted to by the author. A loop of paper was attached to one end of a fine silver wire, and in the loop rested a little beam of light wood. At the ends of the beam, which was six inches long, two spoon-shaped hollows were worked out, in each of which a ball of the substance to be experimented with might be placed. Two cones of soft iron, surrounded by helices of copper wire, were placed at right angles to the beam when horizontally suspended, the one cone facing the ball at one end, and the other cone facing the ball at the other end. The silver wire was carried upward through a tube three feet in length, and was connected at the top with a torsion head. When the cones were excited, by sending an electric current through the surrounding helices the balls were repelled. The index of the torsion head was then gently turned against the repulsion until the balls were brought within one-twelfth of an inch of the ends of the respective cones. The torsion necessary to effect this is evidently the expression of the repulsive force exerted at this particular distance. The strength of the exciting current was measured by a galvanometer of tangents, and it was regulated by means of a rheostat. The cones were excited by currents which varied from 10° to 57° , and the corresponding repulsions were determined. Spheres of the following diamagnetic substances were used:—1. Bismuth of commerce; 2. Chemically pure bismuth obtained by dissolving the material of commerce in nitric acid, precipitating it with distilled water, washing the precipitate for six days successively, and reducing it by means of black flux; 3. Sulphur of commerce; 4. Spheres from a crystal of native sulphur obtained in Sicily; 5. Calcareous spar from Clitheroe; 6. Calcareous spar from Andreasberg, in the Hartz mountains, Germany. In all these cases the diamagnetism of the spheres followed precisely the same law as the magnetism of the sphere of soft iron:—it was exactly proportional to the exciting current. These results cannot be reconciled with the statement that diamagnetism increases with the increasing power of the magnet in a much quicker ratio than magnetism. The experiments of Plücker might be accounted for in many ways, but such explanations, being necessarily conjectural, may be omitted here. It is known that crystalline bodies suspended between the poles of a magnet exhibit phenomena which are absent in the case of amorphous bodies. A certain line through the crystal will take up a certain determinate position; and if this line be forcibly moved away from this position, when the force is removed it will return to it. Thus, a crystal of pure

carbonate of lime suspended by a silk fibre between the poles with its optic axis horizontal, will always turn until the optic axis is perpendicular to the line joining the poles, in which position it will come to rest. This fact was discovered by Plücker, who referred it to the operation of a new force which was entirely independent of the magnetism or diamagnetism of the mass of the crystal. In an investigation conducted by the author in companionship with Prof. Knoblench, of Marburg, this hypothesis of a new force is rejected; and it is there shown that the position of the optic axis, so far from being independent of the magnetism and diamagnetism of the mass, is entirely changed if a magnetic constituent be substituted for a diamagnetic. Thus, for instance, carbonate of iron differs from carbonate of lime only in the fact that in the former case an atom of iron is substituted for an atom of calcium. The crystalline form in both cases is identical, the optic axis of carbonate of iron sets nevertheless from pole to pole with an energy far surpassing that with which the optic axis of carbonate of lime sets perpendicular to the line joining the poles. But why is it that one direction in the crystal takes up a particular position? The torsion balance gives a prompt answer to this question. A sphere of calcareous spar was placed upon each of the spoon-shaped hollows of the beam, the direction of the optic axis through each sphere being carefully marked. The spheres were first placed so that the optic axes were parallel to the axes of the soft-iron cones—and, secondly, perpendicular to the same. The repulsion in the former case was to the repulsion in the latter in the ratio of 53 to 48. If a bismuth crystal be suspended between two poles, the plane of most eminent cleavage will always set perpendicular to the line joining the poles, that is, equatorial. A cube formed from this crystal was placed on each end of the little beam; first, so that the planes of principal cleavage were parallel to the axes of the cones; and, secondly, perpendicular to them. The repulsion in the former case was to the repulsion in the latter in the ratio of 53 to 38. The diamagnetic mass in both these cases is repelled with a greater force in one direction than in any other direction. When the crystal is suspended between two poles, the line which marks the direction of maximum repulsion recedes as far as possible from the poles, and hence sets equatorial. A result the exact antithesis of the above was observed with magnetic crystals. A cube of sulphate of iron was attracted in one direction by a force of 43, and in another direction by a force of 36 : 3. A sphere of carbonate of iron was attracted in the direction of the optic axis by a force of 43, and in a direction perpendicular thereto by a force of 30 : 5. When these crystals are suspended between two poles, these lines of chief attraction approach the poles, and finally set axial. Thus we see that the peculiar phenomena exhibited by crystals in the magnetic field are to be referred to a modification of magnetism or diamagnetism brought about by the peculiar structure of the crystal. Let us endeavour to penetrate this mystery of structure.

Our next inquiry is—What direction is that which is chosen by the respective forces for the manifestation of their greatest energy? To this question the author imagines that a full and intelligible reply is returned by experiment. If the arrangement of the component particles of any body be such as to present different degrees of proximity in different directions, then the line of closest proximity (other circumstances being equal) will be that of strongest attraction in magnetic bodies, and of strongest repulsion in diamagnetic bodies. The torsion balance furnishes us with the means of submitting this conclusion to a direct test. A quantity of bismuth was ground to dust in an agate mortar, gum-water was added, and the mass was kneaded into a stiff paste. This was placed between two glasses and pressed together. From the mass when dried two cubes were taken, the line of compression being perpendicular to two of the faces of each cube, and parallel to the other four. Suspended by a silk fibre in the magnetic field, upon closing the circuit the line of compression turned strongly into the equatorial position, exactly as the plane of most eminent cleavage in the case of the crystal. The cubes were placed one upon each end of the torsion balance, first with the line of compression parallel to the axis of the cones, and, secondly, perpendicular thereto; the repulsion in the former case was to the repulsion in the latter in the ratio of 53 : 30. A greater differential action was thus exhibited in the case of the model than in the case of the crystal. A pair of cubes constructed in the same manner from powdered carbonate of iron exhibited an analogous predominance of attraction in the line of compression. Against this mode of experiment an objection was urged during the meeting of the British Association at Edinburgh last year by Professor William Thomson, of Glasgow. "You have," said he, "reduced the mass to powder, but you have not thereby

destroyed the crystalline form; your powder is a collection of smaller crystals—and the pressing of the mass together gives rise to a predominance of axes in a certain direction, so that the repulsion and attraction of the line of compression which you refer to closeness of aggregation is after all a product of crystalline action. Besides, we know that compressed isinglass exhibits the same optical phenomena as crystals, and you are unable to prove that the action is not due to a *quasi* crystalline structure induced in the gum by compression.” The following experiment will set this point at rest. It will not only show the influence of compression apart from the mere arrangement of the axes or from the influence of the gum, for none will be used; but it will also demonstrate the total nullity of this presumed axial force where opposed to the influence of compression. To this experiment I was conducted by the following accident. The investigation was conducted in Berlin, and the great electromagnet of the university was beside me at the time. Some notion of the power of this magnet may be gathered from the fact, that the copper helices alone which surrounded the iron pillars which composed the magnet weighed 243 pounds. On the top of the pillars two moveable masses of soft iron were placed, each weighing about twenty-five pounds, and between these the substance to be examined was suspended. Before I had thoroughly made the acquaintance of the instrument I hung a fine cube of bismuth crystal between these moveable poles; on closing the circuit the planes of most eminent cleavage receded to the equator. Scarcely, however, was this attained when I observed the poles moving towards each other, and before I could break the circuit they had rushed together and clenched their iron jaws upon the crystal. The latter was reduced by the pressure to about three-fourths of its primitive thickness, and it immediately occurred to me that if the theory of proximity were true it ought to tell here. The pressure brought the particles of the crystal in the line of compression more closely together, and hence a modification, if not an entire reversion, of the former action might be anticipated. Having liberated the crystal, I boiled it in hydrochloric acid, so as to remove any impurity it might have contracted by contact with the iron. It was again suspended between the poles, and completely verified the foregoing anticipation. The line of compression, that is, the magnecrystalline axis of the crystal, which formerly set from pole to pole, set now equatorial. The experiment was then repeated with a common vice; various pieces of bismuth protected by plates of copper were placed within its jaws, and there pressed to the thickness of a shilling. The plates thus obtained when suspended from their edges in the magnetic field exhibited one unvarying result:—the line of compression stood always equatorial, and it was a matter of perfect indifference whether this line was the magnecrystalline axis or not. In these cases no gum was used, and not only was a predominance of axes present, but they all worked together; they were further assisted by the great mechanical advantage offered by such plates to diamagnetic repulsion; the line of compression nevertheless triumphed over all and determined the position of the crystal. The author concludes his paper as follows: “Whoever denies the influence of proximity will have to answer the following questions:—How is it possible that a greater differential action can be exhibited by a cube of bismuth dough than by the crystal itself? What is it which causes the magnecrystalline axis to forsake its usual position and to set equatorial when the crystal is compressed in the direction of that axis? He must further assume a crystalline structure on the part of wax, flour, shale, and the pith of fresh rolls; for in all these substances the line of compression determines the position of the mass in the magnetic field.”—*Report of the British Association, from the Athenæum.*

ON THE COPYING ELECTRIC TELEGRAPH.

BY MR. C. F. BAKEWELL.

IN the method adopted for transmitting copies of writing, the letters to be transmitted are written on tin-foil with varnish, so as to present a conducting and non-conducting surface. The foil is placed on the cylinder of the transmitting instrument, and a metal style in connexion with a voltaic battery presses on the surface of the cylinder as it revolves. By this means the electric current is continually broken when the style is resting on the varnish, and as the style is made to traverse by an endless screw from one end of the cylinder to the other, it passes necessarily over all the lines of the writing, and about eight times over each line. The receiving instrument is similar to the transmitting one, and on the cylinder of that instrument paper moistened with a solution of prussiate of potass in diluted muriatic acid is

placed; the metal style on that instrument being a piece of steel wire. When the electric current from the positive pole of the voltaic battery passes through the steel point to the paper, a blue mark is made by the production of Prussian blue,—and when the cylinder is in motion, the effect is to draw a series of spiral lines on the paper; but as the lines are broken whenever the varnish writing on the transmitting cylinder interposes, the forms of the letters are transferred from one instrument to the other—the writing appearing of a pale colour on a ground of blue lines drawn closely together. To produce this effect it is requisite that both instruments should rotate exactly together, and this synchronous movement is attained by means of an electro-magnet—one instrument being made to regulate the other by retarding its motion at regular intervals. The regulation of the instrument is also facilitated by a guide-line, consisting of a strip of paper placed at right angles to the writing, by which means the person in charge of the receiving instrument can ascertain exactly how much the speeds of the two instruments differ, and by the addition or abstraction of weight can bring the gaps formed by the strip of paper to fall exactly under each other—which indicates that the two cylinders are revolving at the same rate. It was stated, in answer to questions by members present, that two hundred letters per minute might be copied by the instruments exhibited, and that five hundred in a minute are attainable. To illustrate the facility which this means of telegraphic communication affords for transmitting secret messages, an apparently blank piece of paper was produced, on which a message had been impressed invisibly before the meeting of the Section, and by brushing it over with a solution of prussiate of potass the writing became instantly legible.—*Report of British Association in the Athenæum.*

ON A NEW METHOD OF CONTRACTING THE FIBRES OF CALICO, AND OF OBTAINING, ON THE CALICO THUS PREPARED, COLOURS OF MUCH BRILLIANCY.

BY MR. MERCER.

Mr. Mercer's discovery may be stated in a few words to be this:—a solution of cold but caustic soda acts peculiarly upon cotton fibre, immediately causing it to contract, and, although the soda can be readily washed out, yet the fibre has undergone a change, and water will take its place and unite with the fibre. In a practical view, Mr. Mercer considered that the fibre might be considered by this action to have a sort of acid property to unite with soda and then with other bases. The effect of the condensation was said to be one-fifth to one-third of the total volume of cotton employed. Dr. Playfair then showed some proofs of the influence of this new process upon our cotton manufactures; thus, taking a coarse cotton fabric, and acting upon it by the proper solution of caustic soda, this could be made much finer in appearance; and if the finest calico made in England, known as 180 picks to the web, was thus acted upon, it immediately appeared as fine as 260 picks. Stockings of open weaving were shown, and the condensation process made them appear as of much finer texture. The effect of this alteration of texture was most strikingly shown by colours. The pink cotton velvet had its tint deepened to an intense degree by the condensation process. Printed calico, especially with colours hitherto applied with little satisfaction, as lilac, had strength and brilliancy, besides thus producing fabrics cheaply finer than can possibly be woven by hand. The effect was shown of patterns being formed by portions of a surface being protected by gum from condensation. Thus patterns of apparently fine work can easily be produced. It was stated that the fabrics by this process have much strength given them, for a string of calico one-half condensed by caustic soda will break by 20 oz., while the unacted-upon string of cotton broke with 13 oz.

A discussion ensued, by the remarks of Dr. Faraday, Mr. Warington, and Prof. Dumas and others; and it was proposed that the microscope be employed to ascertain any other obvious change of properties by this new process, that bids fair to exercise an immediate and extensive alteration in the patterns and produce of cotton fabrics.—Dr. Playfair, in reply, said, that caustic soda had long been used for bleaching, but this power of altering the texture only belongs to the cold solution of caustic soda. These specimens were the only complete ones, and he had been permitted to bring them from the Great Exhibition to exhibit before the Association.—*Ibid.*

ON THE GROWTH OF PLANTS IN VARIOUS GASES, *Especially substituting Carbonic Oxide, Hydrogen, and light Carburetted Hydrogen for the Nitrogen of the Air.*

BY MESSRS. GLADSTONES.

DR. GLADSTONE gave the results of experiments made and still in progress, with his brother, Mr. G. Gladstone. After describing the effects on some flowers, as the pansy, the crocus, &c.—

A discussion ensued—Mr. R. Warington suggesting that in such experiments the plants be allowed to take root well before immersing them in the gases; next, that the combined atmospheres were too much saturated with moisture, often causing rapid growth and decay; and that these flowers and roots should be compared with others grown in similar volumes of confined common air.—Prof. Dumas spoke of the great and, indeed, almost unsuspected influence of carbonic oxide gas. The judicial investigations in France had disclosed the fatal effects of this gas as being so much greater than carbonic acid gas. In the atmosphere produced by the burning of charcoal $\frac{1}{10}$ part of carbonic oxide was fatal, while with one-third the volume of carbonic acid the animal was asphyxiated, but afterwards revived.—The Chairman said that he had reason to believe that in the combustion of anthracite, much carbonic oxide gas is produced.—*Report of British Association in the Athenæum.*

ON NITRO-GLYCERINE AND THE PRODUCTS OF ITS DECOMPOSITION.

BY DR. DE VRY.

THIS yellow liquid, nitro-glycerine, seems not to be poisonous, but it explodes at a moderate heat, as was shown by experiment, detonating when the drops of nitro-glycerine on paper were struck a smart blow with a hammer.

From the conversation in the Section, nitro-glycerine appears, like gun-cotton, to have states of apparent inactivity, which are removed by spontaneous causes:—for preparations that resist a certain amount of force applied at one time may readily explode soon afterwards.—*Ibid.*

IODINE.

AN account has been published by M. Chatin of a series of experiments on animal and vegetable substances, with a view to ascertain the amount of iodine that enters into their composition. All vegetables appear to contain more or less of this element, and it abounds in water-cresses. Wine is much more rich in iodine than water, milk richer in the element than wine, and asses' milk more rich in this respect than that of cows. Eggs contain a large portion of iodine. A hen's egg weighing an ounce and a half, was found to contain as much iodine as a quart of milk from the cow.—*Galignani.*

THE PRESERVATION OF ALIMENTARY VEGETABLE SUBSTANCES.

BY M. MASSON.

(*Report presented to the French Academy of Sciences, by Messrs. Richard, Payen, Babinet, and Morin.*)

THE Academy committed to us the examination of the processes for the preservation of alimentary vegetable substances, devised by M. Masson, chief gardener to the Central Horticultural Society, and practised in the manufactory of Messrs. Chollet and Co., 5, Rue Marbeuf.

It is already known that these processes consist in first drying the substances by the application of a moderate heat in a stove, until all the water not necessary for the constitution of the vegetable matter has been driven off, and then submitting the dried substances to great pressure with an hydraulic press.

We visited the manufactory of Messrs. Chollet and Co., where we had the opportunity of examining in detail the progress of the operations, and of making some experiments with the drying and ventilating apparatus.

The operations performed are simple and few in number. The substances to be dried are carefully picked and deprived of their hard parts, as in preparing them for common culinary purposes. They are placed on sieves, which may be made of wicker-

work, but it has been found more economical to make them of cloth or coarse canvas nailed to a frame of wood. These sieves are arranged on stands, and the substances placed on them are submitted to the action of hot air in a stove heated to a temperature of about 120° Fahr.

The heating apparatus has been constructed by M. Chaussonot, and it alternately feeds with hot air two stoves, by means of a vertical pipe about twenty-seven inches diameter, which communicates with each stove by a double horizontal pipe, about fifteen inches diameter, placed on the ground. The two extremities of the horizontal pipe are closed, and the lateral openings disposed on its surface may be opened or closed at pleasure by a register for regulating the introduction of air as it is required. There are altogether fifteen openings for the admission of air, presenting in the whole a surface of about twenty-eight square inches, most of which is at times kept open.

For carrying off the air introduced into the stove, together with the vapour with which it is charged, eleven openings are provided on the side of the stove opposite to the hot-air pipe, presenting a surface of about fourteen square inches, or half that of the orifices for the admission of air. These orifices open into a sort of chamber, communicating with four iron chimneys of about six inches diameter, and three or four yards in height.

By means of an anemometer having some new arrangements for rendering the observations more easy and correct, we endeavoured to determine the quantities of air supplied by the heating apparatus, and carried off by the apertures for its escape. Without entering into the details of the experiments, we may state briefly the principal results. The anemometer having been placed successively before the twelve open orifices of the hot-air pipe, the total quantity of air supplied at a temperature of 198° Fahr., was about 16,241 cubic metres in the hour.

But the experiments showed the remarkable fact, that little or no air escaped at the orifices fixed in the horizontal branches of the vertical pipe nearest to the point at which it joins to the latter at right angles, while the orifices furthest from this point, and nearest to the closed extremities, were those through which most air entered, and here it entered equally at both ends. It was found that the four orifices next to the closed ends, the size of which was the same as that of the other eight orifices, delivered two-thirds of the whole quantity of air that entered the apparatus.

This circumstance admits of easy explanation, being referable to the well known diminution of pressure which fluids undergo on passing through contracted channels, or channels through which they move with great velocity, and the increased pressure caused by any obstacle to their movement.

With regard to the escape of air by the chimneys, there was found to be scarcely any, and the proportions of the orifices, those of the chimneys, as well as the general arrangement of this part of the apparatus, had to be completely modified to ensure a more rapid aspiration. By simply making the orifices for the escape of the air to communicate directly and separately with the chimneys, so great an improvement was effected, that the period required for the evaporation of a given amount of liquid was reduced by one-fifth.

Fresh vegetables were scarce at the time of our experiments, so that only two sorts were submitted to the process, namely, savoy cabbages and spinach.

Nine hundred and twenty kilogrammes (2024 pounds avoirdupois) of the savoy cabbages were picked in one day by thirty women, and after the picking yielded 725 kilogrammes (1585 pounds avoirdupois) of green matter to be dried. This was spread out on 710 sieves, which would be at the rate of one kilogramme (2lb. 3oz.) per sieve of about one square metre (thirty-nine inches). After being left in the stove for twenty-eight hours, at a temperature of from 100° to 120° Fahr., it was reduced to sixty-nine kilogrammes (151lb. 11oz.) of dry matter; having thus lost 656 kilogrammes of water, or eighty-seven per cent. of its original weight. During these twenty-eight hours, 300 kilogrammes of Charleroi coals were consumed, each kilogramme of which, therefore, vaporized 2.18 kilogrammes of water.

The second experiment was made with spinach: 820 kilogrammes (1804 pounds avoirdupois) of spinach were picked in one day by thirty women, and were thus reduced to 639 kilogrammes (1405 pounds) of matter to be dried. This was put into the stove on 710 sieves, in quantities of about two pounds to each sieve, and was reduced by the application of a temperature of 100° to 120° Fahr. for twenty-two hours, to seventy-one kilogrammes (156 pounds) of dry matter; having thus lost eighty-nine per cent. of the original weight. The consumption of coal was 250 kilogrammes, each kilogramme of which, therefore, vaporized 2.272 kilogrammes of water.

Thus in these two experiments we see that green vegetables lose the immense proportion of seven-eighths of their weight, which constitutes the important feature in M. Masson's process.

An hydraulic press was then used to reduce the volume of the dry matter, bringing it to a density of 550 or 600 kilogrammes to the cubic metre, thus rendering it perfectly easy of stowage.

With regard to the quality of these products, and the perfect preservation of their flavour, the Academy are already acquainted with the reports made by several Commissioners of Marine, and some of the members have been enabled to judge for themselves. We shall, therefore, content ourselves by quoting a few passages from an authentic document which has been remitted to us, the report of a Commission formed at Cherbourg, by order of the Préfet of Marine, to examine the products presented by Messrs. Chollet and Co., and prepared by M. Masson's process.

The vegetables examined by this Commission consisted of common cabbage, Brussels cabbage, celery, spinach, and a mixture called "*Julienues*," of carrots and potatoes.

After having ascertained, by a preliminary examination, the satisfactory appearance and smell, and general good condition of the products, they were immersed in hot water, and the weight taken before and after immersion, so as to determine the quantity of water absorbed. The results of these experiments carefully made, are expressed in the following table :

Name of Vegetable.	Weight before immersion.	Temperature of Water.	Duration of immersion.	Weight after immersion.	Relation of Weight after and before immersion.
Common Cabbage	280	122° Fah.	33 minutes	1480	5.30
Chervil	73	130°	30 "	324	4.44
Brussels Cabbage	139	122°	38 "	630	4.53
Celery	130	122°	41 "	510	3.93
Spinach	87	113°	30 "	475	5.47
Julienne.....	142	122°	40 "	741	5.22
					4.81

Thus it will be seen that, after immersion, these vegetables have regained the greater part of the water which they contained before being dried.

The report of the Cherbourg Commission states that the vegetables also regained their flexibility and natural colour, and that the form was so well preserved in some of them, especially in the chervil and Brussels cabbage, that they presented the appearance of recently gathered vegetables. The taste and smell were also considerably developed by the immersion in water.

The cooking of these vegetables required from an hour and a quarter to an hour and three quarters, and after seasoning and tasting them, the Cherbourg Commission unanimously declare, that they were all found to be very good ; but the spinach and Brussels cabbage were decidedly superior to all the others, and might be mistaken for these vegetables in the fresh state.—*Comptes Rendus*.

ON THE STATE OF PHARMACY IN THE BRAZILS.

BY M. PECKOLT.

M. PECKOLT, an Apothecary at Rio de Janeiro, in a report of the state of Pharmacy in the Brazils, says,—“I must confine myself to the medical department, for as to Pharmacy, there exists in the interior of the country no distinction between it and the former. Every Physician acts as an Apothecary, and *vice versa* : hence, therefore, every one is called *Doctor*.

“In the less inhabited districts, medical practice is in such a condition that it could not have been worse in the year before the birth of Hippocrates. Anybody who does not succeed in his business, of whatever nature it may be, buys a few purgatives, provides himself with a passport, in which his name is adorned by the obliging official with the title of Doctor, goes into the interior of the country, and his fortune is made. Woe to the poor *Fazendeiro* (landowner) and his negroes if he happen to fall into the hands of such pretended doctor, who feels the pulse, examines

the tongue, shakes his head, and declares the disease to be very dangerous. Then comes the chief question, viz., How much the *Fazendeiro* would like to give to be restored in so many days? This point being settled, purging begins, and if the patient gets worse, the doctor is sure that some fault has been committed in the diet, &c. I know a young fellow, who was a stable-boy in some Royal Mews in Europe, then became a waiter in the United States, and is now conferring on the Brazilians the benefit of his extensive knowledge. On one occasion he was called to a child affected with rickets, and the first thing he did was to declare that the disease was of a highly infectious nature. He, however, consoled the parents by telling them, at the same time, that he could not only cure the disease, but that he also possessed an efficacious remedy against its infectiousness. The latter was immediately bought at the price asked for it, and the poor child received small doses of red oxide of mercury, because the father had in his youth been once affected with gonorrhœa. The child soon after died in consequence, as the doctor said, of some defect in the diet. As there is sometimes no medical man to be found within fifty miles distance, these charlatans (who are called *Curiosos*) have an extensive field for the exercise of their skill. The following are some of the popular remedies in the Brazils:—

1. *Against consumption*.—The patient must live a fortnight or three weeks in a kind of stall or shed, under which a couple of bullocks are kept, in order that he may inhale their exhalation, which is supposed to promote expectoration, and finally to cure the lungs. My opinion is, that Mr. *Curioso* and one ox would do very well for this purpose.

2. *Against the same*.—Half an ounce of a stone called *Pedra de Sabao* (soap-stone), a kind of serpentine of which culinary vessels are chiselled, half as much *Capicum annuum*, or some other kind of pepper are triturated in a mortar with *Cachaça* (spirit obtained from the sugar-cane [rum]) to a thin paste, to which another glass of *cachaça* is added, the whole well stirred, and taken with horrible grimaces.

3. *In difficult labour* the bit of the bridle of a mare is placed in the mouth of the woman, and plenty of brandy given at the same time.

But enough of these absurdities. There are, however, some herbs which are used by the Brazilians as household medicines with great advantage.

Trinosperma ficifolia of Martius.—The root (very seldom the herb) of this plant, of a very strong and bitter taste, is as active a purgative as jalap, and is given as such in complaints of the liver, frequently also in dropsy. The dose is from twelve to twenty-four grains in powder; or in the form of decoction one drachm to eight ounces of water.

Cissampelos Pareira, Lam., called by the Brazilians *Abutna*. The root is given in decoction (one ounce to twenty-four ounces of liquid) with great success in dropsies. Large quantities are exported to North America.

Spilanthes oleracea, L.—The infusion of the entire plant is used as a gargle against sore throat, and also in diseases of the gums. The herb is a principal ingredient of the *Paraguay-roux*.

Ocymum basilicum, L.—This plant is very frequently employed in baths as a tonic. The women mix it with snuff, partly on account of its pleasant odour, and partly because it is thought to clear the eyes.

Ocymum incanescens, Mart.—A weak infusion of the entire plant is used as a sudorific. It also acts as an irritant, and is more frequently used by the negroes. It is likewise employed in baths against rheumatism.

*Jahannesia princeps**.—This large tree produces a nut of the size of the fist, which contains two kernels of the size of a chestnut. These are frequently used, in various forms, in dropsies and skin diseases. One or two kernels rubbed with sugar, are taken in the morning before breakfast, as active purgatives. The oil pressed from the kernels acts in doses of eight to ten drops. This remedy deserves to be introduced into Europe as a substitute for the more active but more expensive croton oil. The tree grows here in abundance, and the nuts are wasted.

The Brazilians call this tree by its Indian name *anda-acu*; they also employ it against the bite of serpents. Two kernels are triturated with spirit of wine to a paste, then strained, and the liquid taken internally, whilst the residue is applied to the wound. The nuts are also mixed with the food of horses, to allay hunger, and also when they have the so-called plague, when they eat but little, and cannot work.

* This plant is usually denominated *Anda brasiliensis*. An account of the purgative properties of the oil, by Mr. Üre, has been published in the *Pharmaceutical Journal*, vol. ix., p. 9.—*Ed. Ph. Journ.*

Geoffroya vermicifuga, Mart.—A large tree, found in abundance in the primitive forests. The seeds are used as general anthelmintics. The dose for a child is ten to twenty grains in the form of powder with milk and sugar. It is a very strong remedy and much mischief has already been produced by it, as the people mistake its effect, and think the larger doses they give the better. The child is attacked by a violent vomiting, and mucous diarrhoea, which symptoms increase until death ensues.

So much for domestic remedies. As for homœopathy, this is in great favour among the Brazilians. There are now here about twenty homœopathic physicians, and of these, some practise apparently under the superintendence of graduated physicians; for example, one is a soap-boiler (a Jew) from the grand duchy of Posen, who, probably not being well-skilled in the process of saponification, practises now as a very learned doctor, and finds the *Saccharum Lactis* more favourable to him than soda and its allies. A lithographer and a shoemaker have also left their stone and last, and practise with great success. Within a short time, six homœopathic chemist's shops have been established; besides which, each physician has his own laboratory.—*Archiv. der Pharmacie*, May, 1851, p. 226.

WAX AND STEARINE CANDLES.

ACCORDING to established custom, wax candles only are held to be orthodox in Roman Catholic cathedrals and chapels. Some makers of stearine candles having endeavoured to introduce their material, an objection was taken against the innovation, and the question was referred to the Pope, who gave his verdict, as we are informed, in the following terms:—

Pope. Is there not a little stearine in the wax candles? *Answer.* Yes.—*Pope.* May there not be a little wax in the stearine candles? *Answer.* Yes.—*Pope.* Then you have wax and stearine—stearine and wax. I see very little difference.

EXPLOSION OF YEAST.

ON Thursday, July 24, Mr. H. M. Wakley held an inquest at the Bank of England public-house, Praed Street, Paddington, on James Parfett, aged 35, a porter at the Paddington terminus of the Great Western Railway, who was killed under the following extraordinary circumstances:—Mr. George Strange, clerk in the goods department of the station, stated, that at nine o'clock on Tuesday morning he saw the deceased returning from breakfast along the platform, where lay several casks of yeast which had arrived from Oxford. Just as he passed the casks one of them, containing eighteen gallons, suddenly burst with a loud explosion, blowing the cask thirty feet into the air, together with deceased, who was struck under the chin by a corner of the cask. Deceased fell on his back six yards from the spot where the explosion took place. Witness instantly ran to the spot, where he found deceased apparently dead, and bleeding from large wounds under his jaw and on the top of his head. He had him conveyed to St. Mary's Hospital, where he died half an hour after his admission. The barrels appeared to have been very badly hooped. Just before the fatal occurrence, witness observing the yeast escape from the cask, feared an explosion would ensue, as on other occasions yeast barrels had exploded. On one occasion he nearly lost his life thereby. He did not consider the barrels safely secured. Mr. Superintendent Collard, of the railway station, said that the yeast belonged to Mr. North, of Oxford, and that he never before heard of such an accident. There was a clause in the Company's Act which compelled them to convey gunpowder and all combustible material by a separate train, but the Company never considered that yeast came within the meaning of the clause.—After the examination of several other witnesses, the jury returned a verdict that "Deceased was killed by the accidental explosion of yeast."

POISONING BY ARSENIC.

Crown Court, Nottingham—before Mr. BARON PARKE.

SARAH BARBER, aged twenty-two, dressmaker, and Robert Ingram, aged nineteen, butcher, were indicted for the murder of Joseph Barber, the husband of the prisoner, at Eastwood, on the 24th of March last. The case occupied nearly two days, but

the material facts are these:—Deceased was ill for several days before his death, before and during which time the female prisoner had on three several occasions obtained a pennyworth of arsenic for poisoning mice; the third pennyworth was bought by the male prisoner, who, at the inquest swore that Mrs. Barber had thrown it in the fire. Dr. Taylor, who had examined the stomach, intestines, and contents, deposed that he detected arsenic—very little in the fluid and stomach, but a notable quantity in the intestines. He inferred that the poison had been taken repeatedly in small doses. The tissues were well preserved although it was ten days after death, another indication of the presence of arsenic. The verdict was, Sarah Barber guilty, Ingram not guilty.

POISONING BY SCHEELE'S GREEN.

BY THOMAS STEWART TRAILL, M.D.,

Professor of Medical Jurisprudence in the University of Edinburgh.

It is well known that various substances capable of acting as poisons are in common use as pigments, and especially that a very beautiful green is obtained from the arsenite of copper, which is commonly known as *Scheele's Green*. An instance of the deleterious effects of this substance occurred here on the 31st of May.

George Webster Graham, a child of three years of age, had obtained some slips of paper coloured with this material, and had chewed some of it. He returned home, complaining of severe pain over his abdomen, and vomited repeatedly. His mother observed some shreds of the paper in his hands, and saw some of the green matter on his lips and cheeks. The vomiting returned at intervals with much severity, the pain was violent, and I was sent for; but I did not return home for three hours after he was taken ill. In the meantime, his pulse became feeble, his extremities cold, and face livid. I went immediately on coming home, and found that the vomiting had somewhat abated, and that the skin was recovering its heat; but the pain in the bowels was still acute. On hearing the symptoms, I inquired if the child had swallowed anything unusual, heard the story, and on seeing the piece of paper, immediately concluded that it was coloured by arsenite of copper, and had caused the child's illness.

I instantly gave the only remedies at hand,—magnesia in milk, with the whites of two eggs diffused in water,—until I could procure the more powerful antidote, the *hydrated peroxide of iron*. I also directed small portions of milk porridge to be repeatedly given. All the symptoms were so relieved before the peroxide was procured, that I judged it unnecessary to administer that antidote; and next morning the boy was quite convalescent.

On the third day the child passed by stool one or two fragments of the paper, on which some of the green colour was still visible; and for a few days more he did not take his food with his usual relish; but no other bad consequence has followed.

I preserved the shreds of paper which the child had carried home, scraped off a portion of the green colour, mixed it with a little soda flux, and subjected it to heat in a tube; when I obtained a distinct metallic crust, with a crystalline inner surface, an alliaceous smell, and resolvable, by heat and air, into white crystals, with triangular facets, proving the colouring matter to contain arsenic, of which the quantity appears much more considerable than I expected. On comparing the pigment on the paper with Syrne's Wernerian colours, it answers to pale *emerald green* (No. 52).

It seems improper to employ so dangerous a material as *arsenite of copper*, in such large quantity, on articles like paper-hangings, which may often come in the way of children, or other persons little aware of the deleterious properties of this colouring matter.—*Monthly Journal of Medical Science*, July, 1851.

POISONING WITH SULPHATE OF IRON.

BY M. P. LIMOUSIN-LAMOTHE,

Of Saint Affrique.

A MAN, named Matet, returned home on a Thursday evening, carrying a faggot of wood; after this his wife shut the door of the house, and did not open it to any one in spite of the inquiries of the neighbours, who were attracted by sounds of groaning. On the Saturday morning, before daylight, the woman called for help; the neigh-

bours came, and found Matet dead in his bed. As the domestic relations of the couple, and the character of the woman, were of bad repute, the authorities were informed, and repaired to the place with the scientific men who were called in. The latter then learned that the woman had, previously to their arrival, and even during the night, washed a large quantity of linen; and that, according to the wife's statement, Matet had complained of a pain in his side, after which he had died. On dissection, beyond some slight lesions of the alimentary canal, there were found some adhesions of the pleura, and softening of a part of the lung. The ordinary organs for chemical analysis were taken away, and along with them some patches of the bed-cover, stained with fecal matters, and the authorities handed over to them a bottle containing about two wineglassfuls of water, with some bread, a pint bottle of wine, and a packet containing a white powder. Some days after, the author, along with Dr. Ancessy, made a chemical analysis, of which the following are the more important results:—

1st. Arsenic sought in the liver. No result.

2nd. A fourth part of the stomach was carbonised by sulphuric acid, the carbonaceous residue treated with nitric acid to oxidize any metals it might contain. The nitric acid driven off, and the residue taken up in water. A fourth part of this was treated by Marsh's method, without any result.

The remainder of the liquid was subjected to various re-agents, and gave the following results:—Sulphuretted hydrogen at first produced no effect; but the operators, thinking that some sulphuric or nitric acid might be present and interfering with the action, a few drops of ammonia were added to neutralize it; this at once produced a copious black precipitate, which was washed and collected. To determine whether this was due to copper, lead, silver, or iron, a portion of the liquid was tested with prussiate of potash, and gave an abundant blue precipitate. Gallic acid, which from the presence of free acid, would not act at first, gave a deep brown colour on the addition of ammonia. Ammonia and carbonate of soda gave the characteristic precipitate [of oxide of iron]. Copper, lead, and silver were sought for without results.

An important question now arose. Could these precipitates be due to normal iron of the blood contained in the vessels of the organs which were engorged, or were they due to iron swallowed during life? The amount of the precipitates left little doubt that they could not be due to normal iron, their united weight being in fact fifteen grains from about an eighth part of the stomach, and the portions of the small intestines which they possessed. The author, therefore, proposed to seek for the iron in other articles, and to determine the state of combination in which it had originally existed.

3d. In order to obtain more precise ideas as to the origin and amount of the iron which they had found, they treated a portion of the lung with nitric acid. The residue was lixiviated with distilled water and concentrated. In this fluid hydrosulphuret of ammonia and gallic acid only produced a deepening of the colour, and ferrocyanate of potash also only deepened the same. In an hour there were slight deposits from these re-agents, which were only a little more apparent and appreciable next day; yet the lungs were obviously more charged with blood than the stomach and intestines. By way of comparison, 1500 grains of human blood were treated as above, and gave still fainter results with the re-agents.

4th. One-half of the pieces of bed-cover which were stained with fecal matters, were treated with boiling distilled water and filtered. The filtrate passed with great difficulty, and gave very little result with the various re-agents. Presuming that the iron might exist in the state of protoxide, or in the form of an insoluble sulphuret, and had remained upon the filter, the portion which had not passed through was acted on by nitric acid. In this fluid, the presence of iron was abundantly shown by prussiate of potash, hydrosulphuret of ammonia, &c. In these fecal matters there could be no reason to suspect that the iron existed normally; they therefore concluded that it had been swallowed during life. But in what state of combination? This remained to be ascertained.

Sulphuric acid could not be tested for in the liquids from the stomach, because it had been carbonized by sulphuric acid. They therefore sought it in the liquid from the fecal matters, and it was found in small quantity by the action of chloride of barium; but it still remained to be determined, whether the sulphuric acid might not come from other sources than sulphate of iron.

At this stage of the proceedings, the authorities brought to them a bottle containing vomitings of the deceased, which had been found under his bed. This bottle

contained $2\frac{1}{2}$ ounces of a thick paste. If sulphate of iron had been swallowed during life, it ought to be found in the undigested matter.

5th. One-half of the vomitings was taken; they consisted chiefly of bread in the form of a thick pulp, with fatty matters, a piece of bacon, &c. The viscosity of the mass prevented its being treated simply with water; it was, therefore, carbonized by nitric acid, and treated like the other matters. The product of the filtration was divided into two parts, in one of which iron was detected with equal readiness as in the other operations; in the other, sulphuric acid was detected in notable quantity by means of nitrate of baryta. All their doubts were now resolved, but a comparative trial for sulphuric acid was made with ordinary bread, which gave no results.

6th. The clear bouillie used for making a tisane [we presume this means the two wineglassfuls of water, with bread found in the bottle] was tested, and sulphate of iron detected in it.

The little packet of white powder was found to be flour; the bottle of wine contained nothing unusual.

From all the facts detailed above, they drew the following conclusions:—

The stomach and intestines contained sulphate of iron.

This salt could not be derived, at least the whole of it, from normal iron contained in the blood, for the lungs yielded it in infinitely smaller quantity.

The fecal matters contained sulphate of iron.

The vomitings contained sulphate of iron.

The bread and the liquid used as tisane contained sulphate of iron.

This salt had been swallowed during life.

If it was given before the illness of the deceased, it might occasion severe disorder in the economy.

If given during the illness, it might not only aggravate the disorder, but even hasten the death.

In the particular circumstances of the case, it was impossible to determine in what dose, or at what time, the sulphate of iron had been swallowed.

At the trial, long and difficult scientific questions arose; such as,—Is sulphate of iron in itself poisonous? At what dose does it become so? Can legal medicine furnish any precise information on the subject? Can we readily distinguish normal iron from iron swallowed? Upon these and a host of other questions, the opinions of several persons, more or less competent, were laid before the court.

The jury, convinced of the poisoning, and considering the character of the prisoner, brought in a verdict of guilty, and sentence of death was recorded; but from the contrariety of the opinions given respecting the poisonous qualities of sulphate of iron, and the dose in which it could be considered as such, the court and jury have recommended the woman to government for commutation of sentence.—*Annales d'Hygiène*, January, 1851.

POISONING WITH MURIATE OF BARYTA.

BY DR. C. WOLF.

A STUDENT of medicine, who supposed that he had swallowed three teaspoonfuls of sulphate of magnesia, was seized with tormina and vomiting; the pulse was weak and irregular; the tongue natural. Dr. Wolf at first supposed the case to be one of "summer cholera," excited by the purgative; but as in half an hour more he found his patient with ice-cold extremities; pulse 65, irregular and feeble; hands and feet powerless; paralysis of the left eyelid; the voice weak, and incessant griping—he analyzed what remained of the so-called sulphate of magnesia, and found it to be muriate of baryta. The patient took only some sulphuric acid and castor oil, by which the griping was soon removed, but there came on retention of urine requiring the catheter. The muscular powerlessness soon disappeared, and in three days the patient was quite well. He had taken altogether three drachms of the salt. Dr. Wolf detected the chloride of barium in the evacuations by incinerating them.—*Casper's Wochenschrift in Schmidt's Jahrbücher*, No. 1, 1851.

POISONING WITH PRUSSIC ACID.

MR. WILLIAM CALLUM, auctioneer and proprietor of the Cheapside House Repository at Birmingham, has committed suicide, under very lamentable circumstances. It appeared at the inquest, that Mr. Callum had for some time exhibited

symptoms of a mind ill at ease, and he drank deeply, as a witness believed, to drive unpleasant thoughts from his mind; he had been straitened for money, and after his death no fewer than three writs were found upon him. He was of an excitable and irritable nature. His pecuniary embarrassments drove him to engage in bill transactions, and the end was a criminal act. A check for £1000, purporting to be signed by Sir George Chetwynd, was presented by Mr. Callum, or sent by him—the matter is not clearly reported—to a Birmingham bank. Soon afterwards it was discovered to be a forgery. Mr. Suckling, the solicitor of the bank, with Mr. Glossop, inspector of the detective police, went to Mr. Callum's house at Balsall Heath. Mr. Suckling informed Mr. Callum of his errand, conversed with him, and announced that he must give him into the custody of the inspector. Callum requested that he might be allowed to see his wife before he was taken away; and Mr. Suckling readily assented. While he had his arm round his wife's neck, the unhappy man swallowed the contents of a phial: Mrs. Callum noticed the act, and screamed. When the officer entered the room, Callum managed to utter "No," to his wife's statement, and could not articulate more. The phial had contained prussic acid. A surgeon was sent for; but before he could obtain any remedies, if such there were, the patient was dead—in fifteen minutes after swallowing the poison. The appearance of the body a short time after death showed that a large quantity of the poison had been taken. The jury referred the act to "temporary insanity."

POISONING WITH OIL OF BITTER ALMONDS.

On Thursday, July 24th, Mr. William Carter, the Surrey coroner, held an inquest of some hours duration, at the Queen's Arms Tavern, Spa Road, Bermondsey, on the body of Mrs. Sarah Spencer, aged twenty-six years, the wife of Mr. Spencer, the perruquier and perfumer, of King William Street, City, who died from the effects of prussic acid, at her private residence, No. 4, Spa Road. A great number of witnesses were examined, but the following are the short facts of the case as detailed to the coroner:—Some few weeks since the deceased was confined with her first child, and ever since she had been in an exceedingly low and desponding state, but from what arising no one was able to form the slightest conception. She frequently spoke to her attendants of her unhappy state of mind, and more than once said that she should soon die. She also said that she was not like some other parties, or she would have died some time back (alluding, as the witnesses thought, to her having taken poison on previous occasions). On Monday last she went out and purchased at the shop of Mr. Elkington, the chemist, of No. 10, Bamford Lane, Bermondsey, a drachm of the essential oil of bitter almonds and a pennyworth of linseed meal. She made application for a quarter of an ounce, under the pretence of wanting it to scent some pomatum, but Mr. Elkington refused to sell her a larger quantity than one drachm. On leaving the shop, she remarked that it was useless for Mr. Elkington to be so determined, for if she chose she could get a small quantity at each shop in the neighbourhood; and smiling, replied, with all his precautions, he could not bottle up the Thames. She then repaired to her home, and the next morning her husband found her in bed in an insensible state. Dr. Paul, who had attended her in her accouchement, was sent for, and on his arrival found her suffering from the effects of Prussic acid. Everything was done to save her life, but without effect, and she died in less than half-an-hour.—The jury having consulted, returned a verdict of temporary insanity.—*Observer.*

POISONING BY COFFINISM.

On Wednesday, July 23, Mr. Baker held an inquest at the Bell, Ratcliffe-highway, on Henry Steward Davis, aged 13. Deceased, whose mother was a lunatic, was placed under the care of a Mrs. Elizabeth Wanstall, who, on deceased complaining of a pain in the bowels, gave him a powder, obtained for a penny, at the shop of Mr. John Stephens, "medical botanist," potato merchant, and agent to Dr. Coffin. On Wednesday evening, Mr. Stephens prescribed another dose of the powder, and administered an enema. Deceased seemed to be relieved, and suffered no pain. Next morning he was much depressed, and at noon had rattles in his throat, and shortly after he died. From the evidence of W. R. Croker, Mr. Stephens's shopman, it appeared that the shopman delivered the powder to Mrs. Wanstall. He guessed the

quantity he was to give, and did not tell Mrs. Wanstall how it was to be used. The enema was composed of the powder, with some valerian and lobelia. The latter is called a poison, but it is not. The whole was about a quarter of an ounce. Mr. Stephens visits patients, and prescribes and compounds. Witness knows nothing of medicine, except from Dr. Coffin's book. In difficult cases witness consults Mr. Stephens. He does not know what liquid he mixed in the enema.—Mr. Garrett stated that no astringent medicine ought to be administered in the deceased's condition.—The coroner adjourned the inquest to have the stomach examined, after which the jury returned a verdict of "Manslaughter against John Stevens," who was committed for trial.

• ON POISONING BY NICOTINE.

Read before the National Academy of Medicine,

BY M. ORFILA.

GENTLEMEN,—IN laying before the Academy a memoir on Nicotine, on the 20th of last month, I stated that I did not think I ought to read it, fearing that it might exercise some influence on the proceedings which were to take place at Mons, eight days afterwards. My scruples are now entirely removed, because I was present at the three first sittings of the Court of Assizes at Hainaut, and have heard the examination of the accused persons, and the depositions of some of the witnesses. My memoir, supposing it to be published to-morrow, and consequently much before the sentence will have been pronounced, will not aggravate the situation of the accused, nor increase the power of the ministers of justice. You will see in fact, that after describing nicotine, I came to this conclusion, that it may be easily detected in the digestive canal, the liver, the lungs, and all those organs into which it has been carried after its absorption. Now, M. de Bocarmé confesses that he prepared some nicotine, that Gustave Fougny took an appreciable dose of it, and died very shortly afterwards. Consequently, he cannot dispute the fact of M. Stas having found this alkaloid in the body of his brother-in-law. It is of little importance to us that Madame de Bocarmé accuses her husband of being the author of the crime, whilst he, on the other hand, attributes the death of Gustave to a mistake of his wife's, who might inadvertently have poured the nicotine into a glass instead of wine. It will be for the jury to decide what truth there is in these assertions; as scientific men, we ought to confine ourselves in this case to the solution of the chemical and medical problems relating to this subject.

I think I ought to read to the Academy the textual memoir, without the preamble, which I composed a fortnight ago, when the principal circumstances, which have since been developed, were but imperfectly known.

The principal object of this paper is to show:—

1. That we may characterize pure nicotine as easily as we can a poison derived from the mineral kingdom.
2. That we may detect this alkali in the digestive canal, and assert its existence there, although it be present only to the extent of a few drops.
3. That it is sufficiently easy to prove its presence in the liver and the other organs, after it has been absorbed.

1. *Pure Nicotine may be characterized as easily as a Poison derived from the Mineral Kingdom.*—Nicotine, discovered in 1809 by the illustrious Vauquelin, was studied in 1828 by Messrs. Posselt and Reimann, who found it in different species of nicotiana, in *macrophylla rustica*, and *glutinosa*. Messrs. Boutron Charlard and Henry described some of its properties in 1836. Havanna tobacco contains two per cent., that of Maryland 2.3, that of Virginia 6.9, that of Alsace 3.2, that of Pas-de-Calais 4.9, that of the Nord 6.6, and that of the Lot 8. It is classed among the *natural volatile vegetable alkalis*, which are only three in number, namely, *conicine*, *theobromine*, and *nicotine*. This last is entirely composed of hydrogen, carbon, and nitrogen. It may be represented as a compound of one equivalent of ammonia (H_3N), and of one of a hydro-carbon containing four equivalents of hydrogen and ten of carbon (H_4C_{10}). It is now obtained by a much more simple process than was formerly adopted, which consists in passing the vapour of tobacco into water acidulated with sulphuric acid. Sulphate of nicotine is thus speedily produced, and this has to be decomposed by a strong alkali. It is then only necessary to apply sufficient heat to volatilize the nicotine. This mode of preparation indicates that smokers in respiration

the smoke of tobacco introduce into their bodies a certain quantity of the vapour of nicotine.

Characters of pure Nicotine.—It is in the form of an oleagenous, transparent, colourless, tolerably fluid, anhydrous liquid, of the density of 1.048, becoming slightly yellow with keeping, and tending to become brown and thick from contact with the air from which it absorbs oxygen; its acrid odour resembles but slightly that of tobacco; its taste is very burning. It volatilizes at 77° F., and leaves a carbonaceous residue. The vapour which rises presents such a powerful smell of tobacco, and is so irritating that it is difficult to breathe in a room in which one drop of it has been spilt. If this vapour be approached with a lighted taper, it burns with a white smoky flame, and leaves a carbonaceous residue as an essential oil would do. It *strongly blues* reddened litmus paper. It is *very soluble in water*, in alcohol, and in fat oils, as also in *ether*, which easily separates it from an aqueous solution. The great solubility of nicotine in both water and ether forms an important fact in its chemical history, as the greater number of vegetable alkalis, not to say all, if they dissolve easily in one of these liquids, are not readily soluble in the other.

Nicotine combines directly with acids, disengaging heat. Concentrated pure sulphuric acid, without heat, produces with it a wine-red colour; on the application of heat to this it becomes thick, and acquires the colour of the dregs of wine; if it be boiled it blackens and disengages sulphurous acid. With cold hydrochloric acid it disengages white vapours as ammonia does; if the mixture be heated it acquires a violet-colour, the intensity of which increases with prolonged ebullition. Nitric acid, aided with a little heat, imparts to it an orange-yellow colour, and white vapours of nitric acid are first given off, then red vapours of hyponitrous acid. If it be further heated the liquor becomes yellow, and by ebullition it acquires a red colour resembling that of chloride of platinum. Prolonged ebullition gives a black mass. Heated with stearic acid it dissolves and forms a soap, which congeals on cooling, and is slightly soluble in water, and very soluble in heated ether. The simple salts of nicotine are deliquescent, and difficultly crystallizable. The double salts which it yields with the different metallic oxides crystallize better.

The aqueous solution of nicotine is colourless, transparent, and strongly alkaline. It acts like ammonia on several reagents; thus, it gives a white precipitate with bichloride of mercury, acetate of lead, protochloride and bichloride of tin; a canary yellow precipitate with chloride of platinum, which precipitate is soluble in water; a white precipitate with salts of zinc, which is soluble in excess of nicotine; a blue precipitate with acetate of copper. This precipitate is gelatinous, and soluble in excess of nicotine, forming a blue double acetate, similar to that formed by ammonia with the same salt. It gives an ochre-yellow precipitate with salts of the sesquioxide of iron, insoluble in excess of nicotine. With sulphate of protoxide of manganese it gives a white precipitate of oxide, which speedily becomes brown by contact with the oxygen of the air. It separates the green sesquioxide from the salts of chromium. The red permanganate of potash is instantly decolorized by nicotine, as by ammonia, although this latter alkali acts more slowly and must be used in larger proportion.

The following reactions may serve to distinguish the aqueous solutions of nicotine from ammonia. Chloride of gold yields a reddish yellow precipitate, *very soluble in an excess of nicotine*. Chloride of cobalt yields a blue precipitate, which changes to green; the oxide thus formed does not readily dissolve in excess of nicotine, whilst ammonia dissolves the green precipitate and forms a red solution. Aqueous solution of iodine gives a yellow precipitate with solution of nicotine, as chloride of platinum would do; with an excess of nicotine it acquires a straw colour, and it is decolorized by the action of heat. Ammonia, on the contrary, immediately decolorizes the aqueous solution of iodine without rendering it turbid. Pure tannic acid gives with nicotine an abundant white precipitate. Ammonia gives no precipitate, but imparts a red colour.*

* It is interesting to compare the physical and chemical properties of nicotine with those of conicine.

Conicine is yellow; *its smell resembles that of the urine of the mouse*, and differs entirely from that of nicotine; it strongly blues reddened litmus paper. Added to water and shaken with it, it floats on the surface and is not readily dissolved. Ether dissolves it easily. When heated in a capsule it forms white vapours, *having a strong smell of celery mixed with that of the urine of the mouse*. Weak tincture of iodine yields a white precipitate, which acquires an olive colour with excess of the tincture. Pure and concentrated sulphuric acid *does not alter it*; when the mixture is heated it acquires a greenish brown colour, and if the heat be continued it becomes blood-

If to these chemical characters which permit one so easily to distinguish nicotine, we add those resulting from the action which it exercises on the animal economy, it will no longer be possible to confound it with any other body. The following are the results of the experiments I undertook in 1842 on this alkali, and which I published in 1843. (See the 4th edition of my work on Toxicology.)

First Experiment.—I applied three drops of nicotine on the tongue of a small but sufficiently robust dog; immediately afterwards, the animal became giddy, and voided urine; at the end of a minute, its breathing was quick and panting. This state lasted for forty seconds, and then the animal fell on its right side, and appeared intoxicated. Far from showing any stiffness or convulsions, it was feeble and flabby, although the fore paws slightly trembled. Five minutes after the administration of the poison, he uttered plaintive cries, and slightly stiffened his neck, carrying his head slightly backwards. The pupils were excessively dilated; the respiration was calm, and in no way accelerated. This state lasted ten minutes, during which the animal was not able to stand. From this time the effects appeared to diminish, and soon after it might have been predicted that they would speedily disappear entirely. Next day, the animal was quite well. The nicotine I used was evidently not anhydrous.

Second Experiment.—I repeated the experiment with five drops of nicotine on a dog of the same description. The animal showed the same effects, and died at the end of ten minutes, although during four minutes, he showed slight convulsive movements.

Opening of the Body the day following.—The membranes of the brain were slightly injected, and the superficial vessels were gorged with blood; this injection was especially observed on the left side, and in the lower part of the brain. The brain itself, of the ordinary consistence, had the two substances of which it is composed, slightly disintegrated, the striated substance was much injected, as well as the *pons varola*. The membranes which envelope the cerebellum were still more injected than the other parts. Between the first and second cervical vertebra on the right side, that is, on the side on which the animal fell, there was a rather considerable effusion of blood. The lungs appeared to be in their natural state. The heart, the vessels of which were gorged with blood, was greatly distended, especially on the right side, with clots of blood; the auricles and the right ventricle containing much, and the left ventricle none. The superior and inferior *vena cava*, and the aorta, were equally distended with clots of semifluid blood. The tongue was corroded along the middle line, and towards the posterior part, where the epithelium separated with facility. In the interior of the stomach there were found a black pitchy matter and a bloody liquid, which appeared to have resulted from an exudation of blood. The duodenum was inflamed in patches; the rest of the intestinal canal appeared in a healthy state.

Since the above period I have made the following experiments, which I have frequently repeated with the same results, only that in some cases I have found the blood contained in the cavities of the heart in a fluid state, even when proceeding to dissection immediately after death; nevertheless the blood speedily coagulated.

Third Experiment.—At eleven o'clock I administered, to a dog of moderate size, twelve drops of nicotine. A few instants afterwards giddiness came on, and he fell on the right side; he soon manifested convulsive movements, slightly at first, then sufficiently strong to constitute a tetanic fit with opisthotonos; he was in a remarkable state of drowsiness, and uttered no cry. His pupils were dilated; there was no action of the bowels, nor vomiting. He died at two minutes after eleven. The body was immediately opened. The abdomen and thorax, on being cut open, sometimes emitted a very decided smell of tobacco. The heart contained a considerable quantity of black coagulated blood. There was more in the right auricle and ventricle than in the left. The lungs appeared in a normal state. The stomach contained about forty grammes of a thick, yellow, slimy liquid; and here and there parts of the mucous membrane were inflamed. The œsophagus, the intestines, the liver, the

red and afterwards black. Nitric acid imparts to it a *topaz colour*, which is not changed by the action of heat. Hydrochloric acid yields white vapours as ammonia does, and renders it violet, especially when heated. Tannic acid gives a white precipitate, and chloride of platinum a yellow precipitate. The red permanganate of potash is immediately decolorized. Corrosive sublimate yields a white precipitate. Acetate of copper gives a gelatinous blue precipitate, less soluble in an excess of concine than is that formed with nicotine. Chloride of cobalt behaves with it as it does with nicotine. Chloride of gold gives a light yellow precipitate. *Neutral acetate of lead does not give any precipitate*; neither does the subacetate. Chloride of zinc gives a white gelatinous precipitate soluble in excess of the concine. Sulphate of sesquioxide of iron gives a yellow precipitate. The words in italics indicate the means of distinguishing concine from nicotine.

spleen, and the kidneys were in a normal state. The epithelium was easily detached from the tongue; the base of this organ was red and slightly excoriated. The brain was more injected than its enveloping membranes; the *pons varola* was the same as in the second experiment.

Fourth Experiment.—I applied on the eye of a dog of moderate size one drop of nicotine; the animal instantly became giddy and weak in its limbs; a minute afterwards he fell on his right side and manifested convulsive fits, which became more and more powerful; the head was thrown back. At the end of two minutes the convulsions ceased and extreme weakness ensued. Five minutes afterwards the animal could stand but was unable to walk. Ten minutes later he was in the same state without having vomited or had any action of the bowels. Urged to walk, he made a few undecided steps, then vomited about one hundred grammes of a greyish alimentary paste. At the end of half an hour he was in the same state. It was evident that he was recovering. The conjunctiva was sensibly inflamed, and the transparent cornea was, to a great extent, opaque.

2. *We may detect nicotine in the digestive canal, and affirm its existence there, although it may be only present to the extent of a few drops.* I would call the particular attention of the Academy to this paragraph; I have never, in the course of my numerous experiments, seen animals whose death has been almost instantaneous, either vomit or have any action of the bowels.* If it be the same with man, as everything tends to prove it is, the Chemist will, under such circumstances, be in the most favourable condition for detecting the poison, as there will most frequently be a sufficient quantity in the canal to determine its presence.

Before describing the two processes to which I had recourse for determining the existence of nicotine in the stomach and intestines, as well as in the œsophagus, it may be observed that I acted separately on the liquid and solid matters contained in these organs, and on the organs themselves.

First Process.—The contents of the stomach and intestines, or the organs themselves, are placed in a considerable proportion of sulphuric ether; after twelve hours of maceration, it is to be filtered; the ether passes through holding nicotine in solution; most frequently when the matters on which the ether has acted are fatty, the ether holds in solution a soap composed of nicotine and one or several fatty acids; it may also happen that it contains non-saponified nicotine. The ethereal liquid is evaporated almost to dryness by a very gentle heat. The greasy and soapy product obtained rarely shows any alkaline reaction. It is to be agitated, without heat, with caustic soda dissolved in water, to decompose the soap and set free the nicotine. The whole is then to be put into a retort furnished with a receiver plunged in cold water, and heat applied to the retort until no more liquid remains in it. The liquid condensed in the receiver contains either all, or at least a large proportion of the nicotine. It is well to know that, 1st, when heat is applied to the retort, the matter froths, augments in volume, and would certainly pass into the receiver, if the retort was not very large in relation to the quantity of liquid operated upon; 2ndly, even at a temperature of 212° Fahr., the vapour of water carries with it a certain quantity of nicotine, therefore the operations should be carried on as much as possible in close vessels. If these precautions be observed, the distilled liquid will be limpid and colourless; it suffices then to concentrate it over a water-bath, to about a sixth of its volume, to obtain with it all the reactions of nicotine.

Second Process.—The method of which I am now going to speak is evidently superior to the preceding. The matters contained in the stomach and intestines, or the organs themselves, as well as the œsophagus, are macerated in water acidulated by pure and concentrated sulphuric acid, taking, for instance, four or five drops of acid to one hundred and fifty or two hundred grammes of water. At the end of twelve hours it is to be filtered; the liquor which is generally of a yellow colour, contains sulphate of nicotine and a certain quantity of organic matter. It is then to be evaporated almost to dryness in close vessels over a water-bath; then treated with a few grammes of distilled water which dissolves the sulphate of nicotine, leaving the greater part of the organic matter undissolved; it is now to be filtered; the filtered liquor is to be saturated with a little pure hydrate of soda or potash, in order to take the sulphuric acid, and set free the nicotine. The mixture of nicotine and of sulphate of soda or potash is to be put into a retort, and heated as described in the first process; the distilled liquid is to be evaporated over a water-bath in order to concentrate the solution of nicotine.

* If life is prolonged the animals vomit

Instead of distilling the liquor by heat, I have often treated it with ether, this latter decanted and submitted to spontaneous evaporation leaves the nicotine.

Everything tends to show that nicotine may be detected by other processes. Thus by treating the digestive canal with absolute alcohol, with the addition of a little soda it would be dissolved, and by the reaction of the soda, a soap would be formed with the fatty matter, which would set free the nicotine; it would then only remain to distil it by heat, after having evaporated to dryness. Perhaps, also it might be separated by acting on the tissues with pure soda or potash, then evaporating to dryness and heating it in closed vessels.

3. *It is sufficiently easy to prove the presence of nicotine in the liver and other organs after it has been absorbed.*—In 1839 when I had shown that poisons after having been absorbed might be extracted from the organs where they had been carried with the blood, I insisted so strongly on the necessity of examining these organs with a view to the detection of poisons, that it has now become the custom to proceed in this way. How often does it happen, that, in consequence of repeated vomiting and action of the bowels, and also from complete absorption having taken place, there remains no trace of the poison in the digestive canal? Moreover, it is evident, that, in getting the poison from the organs to which it has been carried by absorption, we obtain, in reality, that portion of the poison which has been the cause of death, unless it be shown that it was carried to those organs after death by absorption. M. Stas has conformed, most wisely, to this precept. For my part, I could not, in my researches neglect this important branch of the investigation. The livers of those animals which I had poisoned with twelve or fifteen drops of nicotine, when submitted to one or other of the processes I have described, furnished me with appreciable quantities of this alkali. I scarcely obtained any from the blood contained in the heart, but I had only operated upon a few grammes. Moreover, experience teaches that a great number of poisons absorbed rapidly pass from the blood into the organs, and most especially into the liver.

It may be readily conceived that the research for absorbed nicotine might be fruitless in those cases where death was occasioned by only a few drops of this body; but then the presence of this alkali may be detected in the digestive canal.

Gentlemen, after results such as those obtained by M. Stas and myself, society may feel satisfied. Without doubt intelligent and skilful criminals, intent on puzzling the Chemists, will sometimes have recourse to very active poisons, but little known to the community at large, and difficult to detect; but science is on the alert to surmount all difficulties, penetrating to the recesses of our organs, she extracts evidence of the crime, and furnishes one of the great elements of conviction against the guilty. Do we not know that at the present time poisonings by morphine, brucine, strychnine, nicotine, conicine, hydrocyanic acid, and many other vegetable substances which were formerly believed to be inaccessible to our means of investigation, may be discovered and recognized in a manner to be perfectly characteristic?

During my stay at Mons, and consequently since the deposit of this memoir, I have had at my disposal the complete and remarkable Report of M. Stas, and I have satisfied myself:—

1st. That this Chemist has obtained nicotine from the tongue, from the stomach, and liquids contained in it, and also from the liver and lungs of Gustave Fougies.

2ndly. That he also obtained nicotine by properly treating the boards of the dining-room where Gustave died, although these boards had been washed with warm water, with oil, and with soap.—*Repertoire de Pharmacie.*

The Count Hippolyte Visarte de Bocarmé, confessed his guilt, and was executed at Mons.

ROYAL INSTITUTION.—Friday, June 13.

ON SCHÖNBEIN'S OZONE.

BY PROFESSOR FARADAY.

PROFESSOR FARADAY commenced by stating, that considerable mystery was attached to the subject which he proposed to bring before the members on the present occasion, namely, *Ozone*.* This name had been given by Schönbein, of Basle,

* Probably derived from ὀζώδης, "having a strong smell."

to a substance or condition of matter which manifested itself under very peculiar and widely different circumstances. Schönbein regarded it as an independent body, and a constituent of the atmosphere; but in his (Prof. Faraday's) opinion, it was nothing more than an allotropic condition of oxygen. It was never manifested except where oxygen was present, and where, at the same time, water, in a liquid or vapourous condition, was found. No substance had ever been separated from the atmosphere where ozone existed; but its presence was manifested, not merely by the strong smell peculiar to it, but by certain well-marked chemical properties which the atmosphere containing it possessed.

When electricity is produced from a powerful machine, and allowed to be discharged by a point, there is a feeling of a current or aura as of vapour escaping, and at the same time a remarkable odour. If, during the passage of the electricity, a piece of paper, moistened with a solution of iodide of potassium and starch, be brought near, the discharge causes the production of blue iodide of farina. The blue colour thus produced is the result of the oxidation of the potassium by the *ozone*, and the setting free of the iodine. This is one of the best tests for the presence of ozone. It was formerly supposed that nitric acid was produced by the discharge of the spark, and that the decomposition of the iodide was occasioned by this acid as a result of the union of oxygen with nitrogen in the air: but this theory will not account for the smell and other properties of this extraordinary agent.

Schönbein produces ozone in very large quantities by introducing into capacious bottles, with glass stoppers, pieces of cut and cleanly scraped phosphorus, with a small quantity of water, so that the phosphorus may be partly in and partly out of the liquid. A vapour slowly rises in a current. After ten or twelve minutes the ozone is produced, and may be procured in admixture with oxygen and nitrogen by removing the phosphorus at a pneumatic trough, and thoroughly washing the interior of the bottle with water, in which ozone is insoluble. This body is thus separated from the vapour of phosphorus and phosphorous acid. (This experiment was performed in three bottles, and several bottles of ozone previously prepared were now brought forward.) On introducing paper, wetted with starch and iodide of potassium, into one of the bottles, there was an immediate indication of the presence of this principle, by the production of a dark blue iodide of starch. Another remarkable property possessed by ozone was seen in its bleaching powers. Some ounces of a solution of sulphate of indigo were gradually poured into a bottle containing ozone, and shaken, when the colour was as completely destroyed as if chlorine or chloride of lime had been present. A very small quantity of ozone would thus entirely discharge the colour of a very large quantity of sulphate of indigo.

It has been already stated to be so little soluble in water, that a bottle containing it may be repeatedly rinsed with water without losing its ozonic contents. If, however, the stopper be removed, and it is exposed to air, it soon passes off. Ozone appears to be entirely destroyed by heat; or, at any rate, its production by electricity ceases when sparks are received from a red-hot metallic point. This fact was ingeniously illustrated by insulating a small galvanic battery, capable of raising at pleasure a platina ball to full redness; the battery was made part of the machine, and the platina ball the terminal point from which the discharges of electricity were received. The machine was set to work, and it was clearly and distinctly proved by Professor Faraday that the discharges from the red-hot platina ball produced neither the aura, the smell, nor the decomposing effects on iodide of potassium and starch, which were immediately manifested when the ball was allowed to cool, and the electric fluid was then passed through it.

The oxidizing properties of ozone are indicated upon metals which in practice it is rather difficult to convert to oxides, namely, silver. A piece of polished silver had been placed in a bottle of ozone for several hours, and had acquired a distinctly brown tarnish, not from sulphur, but from a process of ozonation, or, in other words, oxidation. Polished lead similarly treated was also oxidized. Ozone had always a tendency to bring metals and metallic oxides to their highest degree of oxidation. In this respect it was the most powerful oxidizer that was known. A tube containing several rings of metallic arsenic had been placed for a short time in a bottle of ozone. The metal had entirely disappeared, and had become transformed into arsenic acid. Paper wetted with a solution of proto-sulphate of manganese was introduced into a bottle of freshly prepared ozone, and in the course of a short time black spots appeared over the surface, proving that the manganese had passed to a higher degree of oxidation.

Nitrogen and sulphur are easily oxidized by it. Schönbein succeeded in procuring a quantity of nitre (of which a crystallized specimen was shown) by the agency of ozone in contact with nitrogen (of air) and potash. Sulphur was also converted to sulphuric acid. Paper stained with sulphuret of lead was immediately bleached when exposed to an ozonic atmosphere. Some curious experiments of Schönbein's were now shown, in which portraits and inscriptions were seen in white letters on a dark ground, as a result of placing stencilled metallic plates on paper which had been stained brown by sulphuret of lead. The uncovered spaces had been exposed to light and air, or *insolated*. The result was that in these spots the sulphuret of lead had entirely disappeared, having been converted to colourless sulphate of lead by the oxidizing action of ozone.

The alleged bleaching properties of solar light on coloured articles are thus probably due to the agency of ozone,—in other words, to a process of oxidation and alteration of the colour.†

Sulphuretted hydrogen, phosphuretted hydrogen, and all foul effluvia, are speedily oxidized and destroyed by ozone. It is, therefore, the great purifier of the air; and, owing to its continual exhaustion by oxidating processes, it is difficult to discover the presence of ozone in large and populous places, or in close and crowded dwellings. In the open air of the country, and on the sea, it constantly exists in a proportion which is probably subject to great variation, although ruled by laws which are at present unknown. Schönbein had contrived an *Ozonometer* for testing the amount contained in air. It is prepared by immersing paper in a solution made of one grain of iodide of potassium, ten grains of starch, and 200 grains of water. The paper is dried, and, when intended for use, is exposed for some time to the air. There is no change until it is wetted with water, when, if ozone was present in air to which it had been exposed, a blue colour will appear, the intensity of which varies according to the quantity of ozone present and the length of exposure. The ozonometer consists of a series of papers thus coloured in different degrees, and bears some analogy to the cyanometer long since proposed by Humboldt.

Professor Faraday stated that, during the last autumn, when at Brighton, while walking close to the sea-shore, he exposed some strips of this prepared paper to the current of air coming over the sea, and, on subsequently wetting the paper, the presence of ozone was distinctly manifested by the blue colour produced. On another occasion he received on the same paper the current of air blowing over the town, but no trace of ozone could be detected in it. When he went, however, on the windward side of Brighton, so as to catch the air blowing over the downs before it reached the town, ozone was strongly manifested by the result. It was thus established that in populous places there is a constant consumption of this principle.

It had been shown that ozone was evolved with the ordinary electricity of the machine: it was now proved that the current of the battery equally leads to its production. Water was decomposed by a Grove's battery, and the oxygen and hydrogen evolved were conducted through a tube in which cotton soaked in potash had been placed to arrest any traces of acid. The gases evolved at the end of the tube decomposed the iodide of potassium on starch-paper, and gave the usual indication of the presence of ozone.

Ozone is evolved in numerous chemical processes. If pure ether, mixed with water, be introduced into a wide-mouthed capacious bottle, and the vapour allowed to become diffused, it will be found that litmus paper introduced is not reddened, and that starch paper prepared with iodide of potassium is not rendered blue. If, however, a glass rod be made hot in the flame of a spirit-lamp, and then introduced into the vapour of the bottle, litmus paper held above the rod becomes strongly reddened, and the iodide of potassium paper intensely blue. In the oxidation of ether vapour at a low temperature, ozone is evolved.

Ether, in its ordinary state, has no bleaching properties; but the ether thus treated had acquired the power of discharging the colour from a large quantity of sulphate of indigo.

Essential oils are thickened by long exposure to light and air: they become ozonized and their properties changed. This was illustrated by reference to oil of turpentine.

† This hypothesis should have its correctness tested by the exposure of colours known to fade, in hermetically sealed tubes. Oils, it is well known, are bleached in close bottles; but they may contain air, and wherever there is air there is ozone, a very small proportion of which possesses remarkable powers of bleaching.

Freshly rectified and pure oil of turpentine was proved, by admixture with sulphate of indigo, to have no bleaching power. A small quantity of oil, which had been exposed to air and light (the air in a bottle half full), destroyed the colour in a few minutes like chlorine.

We cannot doubt that ozone exerts an important influence on the atmosphere, and, therefore, on the health of animals and vegetables. Schönbein, who is rather sanguine in his views, considers, from the irritant properties of ozone, that an undue proportion of it in air may give rise to epidemic influenza, bronchitis, and other affections of the air passages; and, in making experiments at Basle, he found that, concurrently with the prevalence of these disorders, ozone was very abundant in the air. On the other hand, it has been said that its deficiency in air will account for cholera or fevers, since the foul effluvia or miasmata giving rise to these diseases are not completely destroyed or removed by the oxidizing action of ozone. These, of course, are mere speculations insusceptible of proof; but, in the meantime, it must be conceded that the subject opens a new road to experiment and observation, and that very important results may be obtained by following out Schönbein's researches. —*London Medical Gazette*, June 20, 1851.

REVIEWS.

THE NEW LONDON PHARMACOPOEIA, *Translated and Arranged in a Tabular Form, with the EDINBURGH and DUBLIN PHARMACOPOEIAS, showing at one view the differences in the Formulae of the THREE COLLEGES, together with the Tests given by each College for the Purity of the several Preparations, with Practical Remarks.* By PETER SQUIRE, M.R.I., &c., &c. Royal 8vo, pp. 199. London: John Churchill.

This work will be found extremely useful to the Pharmaceutical Chemist. It is also to the three Colleges matter for serious reflection, as it places in juxtaposition those preparations which differ in strength or composition, while they bear the same name. In some instances, this discrepancy is likely to lead to serious results, unless the greatest vigilance be exercised by the dispenser of prescriptions in which such preparations occur. If any further evidence were required to prove the necessity of education in dispensers of medicine, it is furnished by this circumstance, since it depends entirely on his discretion and judgment whether the patient receives a double dose, or the dose intended by the prescriber. This, in the case of solution of morphia and some other preparations, might lead to serious consequences.

The want of uniformity between the three Colleges, has, for many years, been a subject of complaint. It is an evil which increases with the facility of locomotion, as patients (and prescriptions) traverse the country within a few hours. Mr. Squire brought the subject under the notice of the Pharmaceutical Society, in the year 1845, and his triple Pharmacopœia will serve to keep it constantly before the profession, until the evil is corrected by the united effort of the three Colleges, or the intervention of the legislature.

MEDICINES, THEIR USES AND MODE OF ADMINISTRATION; *including a Complete Conspectus of the Three British Pharmacopœias, an Account of all the New Remedies, and an Appendix of Formulae.* By J. MOORE NELIGAN, M.D., Edin., M.R.I.A., &c. &c. 3d. edit., 8vo, pp. 555. Dublin: Fannin and Co. Edinburgh: MacLachlan, Stewart, and Co. London: Longman and Co.

This is a very useful and practical work. We have reviewed the previous editions, and are obliged to defer any detailed notice of the present edition.

THE QUARTERLY JOURNAL OF THE CHEMICAL SOCIETY. London: Baillière.

HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES. By W. H. RANKING, M.D., Cantab. Vol. 13. January to June, 1851.

THE FIRST STEP IN CHEMISTRY. By ROBERT GALLAWAY, F.C.S., &c. &c. London: John Churchill. 8vo, pp. 91.

SINGULAR SPECIMENS OF THE EDINBURGH PRACTICE OF CRITICISM. By JOHN JOSEPH GRIFFIN, pp. 32. J. J. Griffin and Co., Baker Street, London, and R. Griffin and Co., Glasgow.

The illiberality of publishers to authors is too often a source of well-founded complaint. The pamphlet before us gives an example of an opposite character, in which the publisher is the victim.

We are obliged to defer several Reviews until next month.

TO CORRESPONDENTS.

THE PATENT MEDICINE LICENCE.

HAVING been informed by correspondents at Gosport and Portsea that several penalties of £20 had been claimed of Chemists in those localities for selling stamped medicines without a licence, we made inquiry at Somerset House, and ascertained that although the claim had been made in the usual way the penalties had not been enforced. The subject was at that time under consideration, and it was most likely that the penalties would be mitigated. We were also informed, that in one of the places named, only one Chemist had a licence, and that some who had licences had been brought under the lash for selling without stamps medicines which are clearly liable. It may be useful to mention the circumstance as a caution to others. The plea of forgetfulness in regard to the licence has some weight with the Board during two or three months, but when the licence is ten months over-due it is not so easy to obtain a remission of the penalty. By way of assisting the memory it may be well to remark, that the Patent Medicine Licence becomes due on the 1st of SEPTEMBER, the first day of partridge shooting. A month is allowed before any proceedings are taken, but by the time pheasant shooting begins, the officers from Somerset House are on the look-out.

J. D. (Sunderland).—(1.) Zumpt's *Latin Grammar*, and (2.) Pereira's or Royle's *Materia Medica*.—(2.) Fownes's *Manual*.—(4.) Lindley's *Elements of Botany*.—(5.) Christison on *Poisons*.

A. P. (Bristol).—Varnish for boots. See vol. ii., p. 610.

A. B. C.—(1.) Royle's or Pereira's *Materia Medica*.—(2.) Yes.—(3.) Yes.

Andover.—By "Oxydated acid of salts" we should think muriatic acid was intended, which would not injure the coins if applied with care.

M. P. S.—For sticking labels on tin, &c., French polish answers the purpose.

R. A. P. S.—(1.) Yes, a knowledge of the properties of poisons, and the tests by which their presence is recognized, with their proper antidotes, is considered requisite.—(2.) Probably six months would be sufficient.

H. T. (Croydon).—The Lectures were delivered at the College of Physicians during April and May of this year. They have not yet been published; but will probably appear in the *London Medical Gazette*.

E. W. Martin (Guildford), *Dunelmensis* (Manchester), and several other correspondents, are referred to the early pages of this number, which explain the nature of the Bill and the proceedings concerning it.

X. Y. Z. (Liverpool).—Oil of spearmint, which has become impaired in quality by keeping, may be improved by re-distillation with some of the fresh plant, but cannot be made equal to fresh oil.

A. B. (Darlington).—The Arsenic Act prohibits the sale of arsenic in small quantities unless disguised with indigo or soot. Vermin powders containing arsenic, *unless disguised according to the Act*, would come under its provisions, and the vendor would be liable to the penalty. By analysis the arsenic may easily be detected.

M. H. (Reading).—(1.) (2.) We are not able to answer the questions.—(3.) Only the difference, £5 5s.

Mr. Keating having expressed dissatisfaction at a remark in our last number (page 17) which he construes into an opinion that his specimen of sarsaparilla in the Exhibition has been dyed with logwood, we beg to observe that we expressed no opinion, but merely adverted to its *appearance*. Being anxious to authenticate the specimen, and not having been able to obtain information as to any importation of sarsaparilla from Paraguay, we inquired of Mr. Keating, who replies—"It is not imported direct from Paraguay, though I am perfectly satisfied that it is the produce of that country, and also that it is found in the exact state in which it is exhibited. No doubt the world at some future time will be made more acquainted with the exact spot from whence it comes, but at present that is not desirable. It is not, like the Red Jamaica, given a name which does not belong to it." When Mr. Keating thinks it desirable to make the world more acquainted with the facts relating to this drug, we shall have pleasure in publishing the same.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.
Other Communications to the EDITOR.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. III.—SEPTEMBER 1st, 1851.

THE SCHOOL OF PHARMACY—SESSION 1851-2.

THE courses of lectures at the house of the Pharmaceutical Society will be resumed, as usual, next month, and the Council have decided that these lectures shall, for the ensuing session, be **FREE** to all the **MEMBERS OF THE SOCIETY**.

In the event of the passing of the Pharmacy Bill, it will be requisite to make a new arrangement respecting the School. We have already explained (vol. v., p. 387) that according to the recognized principles adopted by Parliament in reference to institutions of this description, the functions of education and examination are considered incompatible. It is held to be inexpedient to confer on an educating body the powers of examining and licensing, or granting diplomas under an Act of Parliament. When this subject was before the Council in 1846, two propositions were considered. First, the continuance of the Society as an educating body, and the establishment of a College of Pharmacy for conducting the examinations; secondly, the adoption of the Society as the examining body and the relinquishment of the School of Pharmacy.

It was at that time thought desirable to adopt the former course, and the draft of a Bill was prepared accordingly. Several difficulties, however, arose in reference to the details, some of which were rather complicated, involving, as they did, the maintainance of two institutions; and it was afterwards decided that the best course would be to simplify the measure as much as possible, and aim at an extension of the powers of the Society as an examining body. On this principle the Pharmacy Bill was framed, and if the Bill should be carried, the discontinuance of the School of Pharmacy as at present constituted, will be a necessary consequence. Education will in that case be left to private enterprise; and with the demand which a compulsory examination would create, there is every reason to believe that ample means of instruction would be called into existence. The Society has paved the way by the establishment of a School as an example of the kind of institution which is required for imparting to Pharmaceutical Students the requisite qualification. In this respect the School has answered the purpose for which it was intended. That it has always been a heavy drain upon the funds of the Society has been stated from time to time in the Reports of the Council. We have already observed, that on the passing of a Bill making examination compulsory, this expense would cease. In case the Bill should not pass during the ensuing session (and it is proper to be prepared for any contingency), then it will be necessary to consider what arrangements may be advisable in reference to the School, for the purpose of curtailing the heavy annual expenditure.

PROVINCIAL SCHOOLS OF MEDICINE AND PHARMACY.

THE anticipation of a compulsory examination in Pharmacy has induced many to apply themselves to study in a manner which they would not otherwise have thought necessary, and the numerous inquiries on the subject, which have resulted from the late discussion on the Pharmacy Bill, clearly prove that in the event of such a Bill becoming the law of the land, a general impetus will be given to Pharmaceutical education.

To meet this demand it is desirable to take advantage of every opportunity which may present itself, and as the candidates for instruction are spread over the entire kingdom, whatever local facilities may exist ought to be encouraged. It is not likely that provincial Schools of Pharmacy will be found to succeed as separate establishments. In two or three localities—for example, in Liverpool, Manchester, or Birmingham—such schools might probably be kept alive by much zeal and liberality on the part of their promoters. But they can never remunerate the professors, nor is it likely that they would realize a return sufficient to defray the current expenses.

Where a Medical School exists, the establishment of a Pharmaceutical branch for the benefit of Chemists and Druggists may, in some instances, be found practicable and advantageous. A small additional outlay and a modification of some of the lectures, so as to separate the Medical from the Pharmaceutical instruction, would make the institution available for both purposes. It is not desirable for the Pharmaceutical student to extend his studies beyond his own legitimate sphere, in which there is quite enough to occupy his whole attention. In the event of this mutual arrangement being effected, the nature of the education will be adapted to the demand, and this will be regulated by the amount and description of qualification from time to time required by the Board of Examiners. There is at present a great deficiency in the means afforded to Pharmaceutical students for qualifying themselves. The School of Pharmacy in London can only accommodate a limited number as regular students, and a very large proportion of the Apprentices throughout the country are unable to avail themselves of this establishment. We anticipate that a School or Schools on a more extended scale will ultimately be found necessary, and that it will become the usual custom for students, at the close of their apprenticeship, to come to London for a year for the purpose of completing their education. In the mean time every advantage should be taken of available opportunities of improvement wherever they may exist, and those who cannot obtain a complete education in head quarters, should, if within reach of a provincial School, attend such lectures as may be adapted to their wants, and make up the deficiency by private study.

The progressive improvement in the qualification of students under a system of compulsory examination, is exemplified in a Report recently issued from Apothecaries' Hall. Although the Board of Examiners of the Society of Apothecaries has been in active operation since the year 1815, and has brought about a revolution in the qualifications of the members of that body, yet it appears that there is still something to be done, and the regulations contained in the Report are calculated to effect the desired improvement:—

The Court regret to observe, that great ignorance of the Latin language has been the cause of a large portion of the entire rejections; a fact in relation to the preliminary education of medical students to which the Court beg leave to draw especial attention.

The Court have much pleasure in reporting that their recent exertions in promoting the study of clinical medicine and practical chemistry have been attended with most beneficial results: as has been evinced by the marked improvement exhibited by many of the candidates in those important and indispensable branches of medical science.

But the Court have long been of opinion that the great obstacle to the acquisition of sound medical knowledge is the general want of preliminary education among the pupils; and they are convinced that until this serious defect is removed, the progress of medical education will be retarded.

The Court have, therefore, under the sanction of the master, wardens, and court of assistants, proposed to institute an examination in classics and mathematics for junior students, which is to be held for the first time on the 18th of October next.

This examination is for the present voluntary, but its object is twofold:—First, to encourage in junior students the acquisition of such an amount of preliminary knowledge as will enable them to enter with advantage upon the extensive field of medical study; and, secondly, to supersede the necessity of requiring from the candidate a technical acquaintance with medical Latin authors at the termination of his medical studies, instead of demanding a due amount of preliminary information at his commencement.

Apothecaries' Hall, August, 1851.

HENRY BLATCH, *Secretary.*

It will be observed that the deficiency complained of relates to the preliminary education, and that the remarks on this subject are equally applicable to the Pharmaceutical student. Unless the mind is properly trained at school, and a foundation thus laid for subsequent studies, it is vain to expect proficiency in any profession. The preliminary (or classical) examination of the Pharmaceutical Society is at present very lenient. It is merely sufficient to prove that

the candidate has had a certain amount of classical education, sufficient to enable him to translate prescriptions. If more than this were required, *while the examination is voluntary*, it would operate as a prohibition. The Society of Apothecaries can enforce such regulations as they may think right in this respect. It is only fair, however, before introducing the improved curriculum, to allow time for the students to whom the rule applies to qualify themselves; it is, therefore, voluntary for a limited period. How and where the education is to be derived is left to the discretion of the student; but the nature of the preliminary education as well as the subsequent studies, is regulated by the demand, and this is, as we before stated, regulated by the Board of Examiners.

PHARMACEUTICAL EXAMINATIONS IN SCOTLAND.

THE desire expressed by our brethren on the other side of the Tweed to be provided with a Board of Examiners in Edinburgh is reasonable, and entitled to every encouragement. The Charter of the Society empowers the Council "by themselves, or such competent persons as they should think fit to appoint, to examine and to decide upon the admission or rejection of Members, &c. and to grant such certificates or diplomas as they shall think proper to the persons whom they shall deem qualified to be such Members, Associates," &c. The Council is not limited to the appointment of one Board of Examiners, nor is there any restriction as to the place or places at which the examinations are to be conducted. There is according to the present regulations a latitude allowed in the classical examination, which, in the case of Candidates residing in the country, may be conducted by a schoolmaster or other qualified person, subject to the approval of the Council. These and other details are regulated by the bye-laws.

Such being the powers possessed by the Council under the Charter, it was not thought necessary to introduce into the Pharmacy Bill a special provision for the appointment of a Board of Examiners in Edinburgh. This, however, was added in the amended Bill without hesitation, as soon as the wishes of the Members in Scotland on the subject were made known.

It being now clearly understood that in the event of the Bill being passed during the ensuing session, a Board of Examiners is to be appointed for Scotland, we may inquire, Why should the accomplishment of this object be left to a contingency? What obstacle exists to the appointment of a Board without delay? This would extend the influence of the Society, by affording an additional demonstration of its practical usefulness. Hitherto Scotland has taken but a small share in the operations of the Society. While the list of Members exceeds 1600 (exclusive of Associates) the number of Members and Associates in Scotland does not amount to forty; of these, twenty Members reside in Edinburgh. We are informed that there are many other Chemists in Scotland desirous of becoming Members, but precluded from so doing because it is not convenient to them to come to London to pass the examination.

It occurs to us that the appointment of a Board of Examiners in Edinburgh, and the institution of examinations, in the first instance very lenient, and gradually increasing in stringency, would meet the requirements of the case, and expedite the accomplishment of what is desired. The comparatively small number of Chemists who have joined the Society in Scotland is not surprising, when we consider the distance from the Southern Metropolis in which the movement originated, and it is probable that the establishment of another nucleus in the metropolis of North Britain would afford a rallying point or centre of attraction, which would tend to spread and equalize the influence of the Society throughout the entire kingdom. The emulation between North and South would stimulate both, and the Society would become in reality, as it is in name, the Pharmaceutical Society of Great Britain.

HOMŒOPATHY AND COFFINISM.

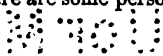
At the Annual Meeting of the Provincial Medical and Surgical Association, held at Brighton on the 13th and 14th of August, the subject of Quackery was discussed at some length. The thanks of the Association were voted to the Royal Colleges of Physicians and Surgeons, Edinburgh, for their determined stand against homœopathic delusions and impostures, and to the Universities of Edinburgh and St. Andrews for their resolution to refuse their diplomas to practitioners in homœopathy. A Committee was appointed on the 13th to consider the best course to be adopted in reference to the prevalence of irregular and unprofessional practices. Dr. Cormack brought up the Report on the 14th, which was discussed, received, and adopted. The Report referred chiefly to homœopathy; but Dr. Cormack, in an able speech, pointed out the fraternity subsisting among the quackeries of the day, and the manner in which their several professors play into each other's hands. The homœopath occasionally tries a little mesmerism or hydropathy, or any other system which may suit his purpose. Others return the compliment, and this kind of compact is carried on to a great extent. Dr. Cormack alluded to the homœopathic theory, that all disorders are of "psoric origin," a theory recently expatiated upon by the Rev. Mr. Everest in a sermon. This reverend gentleman attributed socialism, as well as many other evils, moral and physical, to the same source, and intimated that even the redemption of mankind was not complete until the arrival of Hahne-mann, who had pointed out the mode of eradicating by the aid of what he calls "the medicine of love," the leprosy (or itch) with which the world is infested. Some portions of the sermon were stated by Dr. Cormack to be too blasphemous to be quoted. The principal feature in the Report, was the recommendation that the following classes of persons should be ineligible as Members of the Association:—1st. Professed homœopaths; 2nd. Those who practise homœopathy in combination with other systems; 3rd. Those who hold professional intercourse with practitioners of the above classes.

Dr. Malden moved the adoption of the Report, and Dr. C. J. B. Williams, in seconding it, exposed in a most forcible manner the absurdity of the infinitesimal doses; and stated, that he had frequent opportunities of witnessing the melancholy results of this infatuation, in the cases of patients, who having been tampered with, until the disorder had arrived at an incurable stage, came to him in despair, when too late for medical treatment to be available.

Several speakers followed, and with no little enthusiasm anathematized the quackeries of the day, and the patronage of these systems of quackery by the aristocracy and the clergy; but with the exception of Dr. Cormack and Dr. Williams, those who addressed the meeting, depended more on declamation than argument. Dr. Cowan (of Reading) maintained that argument was not necessary, for he said, "When I hear a man start with the assumption that two and two make five, I distrust his judgment, and think it needless and in vain to waste words by arguing with such a person. I place the homœopath in the same category, and consider that the members of the profession should hold no intercourse with those whose principles are so diametrically opposed to known facts and the experience of ages."

The analogy is obvious, but when we see that homœopathy is patronized by the aristocracy and preached from the pulpit, we think a dispassionate exposure of the absurdity of the theory would be more appropriate than a simple negation however warmly expressed. The public are ever disposed to confound "*post hoc*" with "*propter hoc*," but they are not so ready to accept a denunciation in lieu of an argument. Even the expression of strong indignation by the profession is calculated to give unmerited importance to a palpable delusion.

The fact which should be promulgated and kept before the public is the *imposture*, which consists in attributing to the alleged efficacy of the infinitesimal sugar-plums, results which are, in fact, produced by an effort of nature, assisted by suitable diet and exercise, or by the *slly administration of potent medicines* either under some plausible pretext, or without the knowledge of the patients. There are some persons who always "turn their money and spit upon it for luck"



the first time they see the new moon, and whatever good fortune they may enjoy during the current month they attribute to the performance of this ceremony. Such persons are easy dupes of the homœopath: for whether they swallow a globule or whether they spit on their money is a matter of no consequence—either they recover and attribute the recovery to the mystic charm, or they become alarmed, send for a doctor, and attribute their illness to his treatment. But the dupe will sometimes reply to this allegation “What do I care so long as I am cured?” It makes no difference to me whether I am cured by a globule, by spitting on a sixpence, or by any other means recommended by the homœopathic doctor. I was ill—I swallowed a globule, and am well! On a former occasion I was ill—I swallowed a cart-load of physic and suffered a martyrdom; true, I recovered in spite of the treatment, but under the homœopaths I recovered pleasantly, speedily, and without annoyance*.” The simple answer to this statement is an appeal to facts and a comparison of the symptoms on the two occasions. Such a patient may be asked what could be his opinion of the efficacy of a medicine in quantity so small that a single ordinary dose of the active ingredient would be sufficient, when so comminuted, to supply every inhabitant of the globe with a globule? He may probably evade the question by observing that ordinary doctors sometimes give bread pills or coloured water to nervous patients who will not be satisfied without taking medicine, although no medicine is required. The globule is then placed on a par with the bread pill, or the coloured water, which are admitted to be remedies adapted to the mind and not to the body, and the enthusiast is self convicted of that mental imbecility which requires such treatment. A maniac, being destitute of the power of correct reasoning, must be treated as a maniac, and in proportion as a patient approximates to this unfortunate condition, his medical attendant must adapt his remedies to the degree of fatuity which is found to exist.

There are many persons who suffer under imaginary disorders, who have no organic disease, and require moral restraint and a reform of vicious habits rather than medicine. For such persons homœopathy, or any other mode of regulating the regimen and amusing the mind may prove efficacious, but the dishonesty of the system consists in the actual or pretended application of the same line of treatment to the monomaniac, the hypochondriac, and the victim of organic disease. There are some professed homœopaths who possess shrewdness and ability to discriminate and escape from the dilemma by artifice, by deviating from their professed principles, or by handing over some of their patients to regular medical practitioners when they desire to be released from responsibility. This, however, is not the case with all members of the craft. *The theory is general*, the doctrines are propounded with all the pretence of infallibility, and though the promulgators of the invention may protect their own reputation, they cannot protect the public against the danger arising from misplaced confidence in imitators less cunning than the originals. Whatever may be the source of disease in general, we are of opinion that the disease of homœopathy is of “psoric origin,” but the seat of the disorder is not between the fingers: it is in the palm of the hand. The theory is an invention designed to mystify and entrap the credulous—it is the *advertising van* of the craft. The patients having been caught, the professors of the theory are not bound to adhere to it, any more than a tradesman who advertises his goods at infinitesimal prices, feels bound to adhere to those prices when he finds a customer within his clutches. The following are good illustrations of homœopathy when consistently practised: A child (an only son) was attacked with an acute disorder requiring active treatment. He was placed under a homœopath, who trifled with the symptoms in the usual way, until the parents became alarmed and sent for two physicians. It was then too late; the child died in the course of the day. A few days afterwards, the father called on the physicians, and entreated them to give him a certificate to the effect that the child would, in all probability, have died under any treatment. He said that his wife was distracted with the idea that she had been the cause of the death of her son, by trusting to homœopathy, and unless

* We have heard a homœopathic practitioner triumphantly quote an observation of a lady of rank, that she “would rather die under Quin, than live under her former medical adviser.”

something could be done to remove this impression, he felt persuaded that her mind would sink under it. We are not authorized to mention the names of the parties, but the facts are authenticated, and the case is of recent occurrence.

A nobleman visits his kennel, and observing that one of his dogs looks dull, he takes his medicine-chest from his pocket, selects an appropriate globule, and places it on the dog's tongue. The dog wags his tail, his master fancies he looks better, and retires to breakfast, enjoying that serenity of mind which usually follows the performance of a good action and thus deriving probably more benefit from administering, than his dog from swallowing, the globule.

COFFINISM.

COFFINISM is another variety of quackery, addressed to a different class of persons. There is no disguise or mummary in this system. It is an open and impudent repudiation of medical science, physiology, and anatomy. The entire code of practice is comprised in Dr. Coffin's book; the practitioners are shoemakers, chandlers, mechanics, &c. The remedies are medicinal plants, some of which are powerful poisons. They are not administered in infinitesimal doses, but by the teaspoonful or the pennyworth; and for the protection of the practitioners when inquests occur, it has been found expedient to establish a "Defence Fund," to which all subscribe, and in the benefit of which each participates when in trouble. During the past month a "Medico-botanic demonstration" was made, occupying four days, during which time the votaries visited Dr. Coffin's Museum, Catlin's Museum, and Kew Gardens; they drank tea at Tabernacle Row, Finsbury; they assembled in Trafalgar Square, and proceeded "in procession through Pall Mall to the Crystal Palace, with appropriate banners, and headed by Drs. Coffin and Harle." The profits of the entertainment go to the "Defence Fund." This description of quackery is quite as formidable as the "Do-nothing" system. It is practised among a class of persons who are less able to take care of themselves than the wealthy dabblers in globules, and it is gaining ground to an extent which must ultimately effect its own cure.

A mother thinks her child looks dull, she takes him to a Coffinite cobbler, who administers a teaspoonful of lobelia inflata; the child becomes worse, the dose is repeated. The child dies, an inquest is held. Dr. Coffin comes forward with his "defence fund," the jury are made to believe that the death of the child may be attributed to the treatment of the medical man who was called in at the last extremity. The cobbler is acquitted, and returns to his practice, impressed with the conviction that if the child had taken another dose of his medicine the catastrophe would not have occurred.

The fraternity subsisting between the professors of homoeopathy, hydropathy, mesmerism, and quackery in general, may be easily explained. Every class of quacks is interested in disparaging the medical profession. In this crusade, they all unite, including Coffinites, "silent friends," and advertising empirics of every description. They are all free-traders, in the most extended sense of the term. The medical profession, on the other hand, instead of uniting to combat this legion of assailants, waste in internal disagreements the energy which might, if properly applied, be made available for the exposure and frustration of the impositions daily practised on the public. The disputes between the several classes of regular practitioners weaken the cause, by giving rise to an impression that the object in view is a monopoly of the loaves and fishes.

This impression exists to some degree in reference to Pharmacy. It is supposed that the organisation of the Chemists with the necessary regulations for education and examination, is intended as a means of placing a restriction on trade merely for the benefit of the class recognised as qualified. In both cases, this is an error which ought to be explicitly corrected. The same principle applies to medical and to pharmaceutical regulations. The protection required is not an interference with the principle of free trade. It is only that protection which is conducive to the interest of the public, against the impudent frauds, and dangerous practices of ignorant or designing quacks.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

ELECTION OF PRESIDENT, VICE-PRESIDENT, AND TREASURER.*

At a Meeting of the Council held on Wednesday, June 4th, the following Members were elected:—

President Mr. THOMAS HERRING 40, Aldersgate Street.

Vice-President... Mr. HENRY DEANE..... Clapham.

Treasurer..... Mr. R. H. PIGEON Throgmorton Street.

THE DELIVERY OF THE JOURNAL TO THE MEMBERS OF THE PHARMACEUTICAL SOCIETY.

At the last Anniversary of the Society, a complaint was made by some Members that the Journal was not received by them until two or three days after the day of publication, and the following Resolution was carried:—

Resolved, "That the Council be requested to consider the practicability of delivering the Journal to all the Members of the Society, free of charge, on the date of publication."

In pursuance of this Resolution, a Committee was appointed to consider the subject, with a view of suggesting a better arrangement in case this should be found practicable. The plan which has been adopted for some years, is carried out by the Secretary, who receives for the performance of the duty a fixed sum out of which he defrays all the expenses of packing, portorage, booking, &c. The parcels to the country are forwarded in accordance with instructions received, from each locality. The following is the REPORT of the COMMITTEE appointed to consider the delivery of the Journal.

"The Committee have duly considered every branch of the subject, including the mode of transit, the expense, and the nature of the contract.

"The Committee have reason to believe that the present arrangement is much more complete and satisfactory than any arrangement previously adopted. No complaints are made respecting the London delivery, and very few from Country Members. In cases where irregularity exists, the Committee are of opinion that this may be rectified by arrangement between the parties concerned and the Secretary.

(Signed)

" THOMAS HERRING
J. GIFFORD
WM. BASTICK
F. R. GARDEN
J. T. DAVENPORT
W. W. BIRD."

LIST OF MEMBERS, ASSOCIATES, AND APPRENTICES

(Continued).

ELECTED IN APRIL, MAY, JUNE, JULY, AND AUGUST.

MEMBERS.

BIRMINGHAM	Kenwick, Edwin C.	92, Sherlock Street
BRIGHTON	Funnell, William H.	42, St. George's Road
	Robson, Thomas	26, Clifton Terrace
CARLISLE	Bell, William	Rickergate
CHEL TENHAM.....	Butcher, Thomas	Bath Road

* This notice appeared on the cover of the July number. Its insertion in the Transactions was delayed until this month, as there has been no other official matter during the interval.

MEMBERS, continued.

CROYDON.....	Hunt, Thomas	North End
CULLUMPTON	Frost, William H.	Fore Street
DEVONPORT	*Radford, Isaiah C.	Fore Street
DONCASTER	Cowburn, George T.	St. Sepulchre Gate
GEELONG	Rastrick, George T.	Australia
GRANTHAM	Cheshire, John	Wharf Road
HALIFAX	Baldwin, Joseph L.	2, Woolshop Street
LEWES.....	Davey, Edward	178, High Street
LINCOLN	*Peppercorn, Benjamin	Guildhall Street
LIVERPOOL	Cooper, Joseph	Park Road
	Evans, Thomas	1, Great Homer Street
	Hodson, Launcelot V.	Edge Hill
	Houghton, James	4, Elliot Street
	Pearson, Edward	69, Park Road
LONDON	Evans, John H.	60, Bartholomew Close
	Couch, William O.....	Theberton Street, Islington
	Jeynes, Edmund.....	49, Great James' Street, Marylebone
LONG SUTTON,.....	Hillyard, Samuel F.	Market Place
NORTHWICH	Burgess, William	Wilton Street
OXFORD	Howson, Thomas B.	18, Queen Street
PLYMOUTH	Baker, William P.....	33, Union Street
PONTEFRAC T	Wilton, Matthew H.	Market Place
PORTSEA	Gilbert, George	15, Butcher Street

Honorary and Corresponding Member.

Dr. Xavier Landerer.....University of Athens.

MAJOR EXAMINATIONS.

Davidson, James	Newcastle
Farrer, John D.	Yarmouth
Green, Joseph	York
Groves, Thomas B.	Weymouth
Hunt, Richard	Winchester
Jackson, William.....	Retford
Langman, Peter	Chatteris
Metcalfe, Christopher	York
Nall, Thomas M. ...	Bakewell
Reeve, Edward.....	London
Reynolds, Richard	Leeds
Row, Frederick	Yarmouth
Symonds, John Crane.....	Hereford
Watts, Henry Thomas	London
Whitfield, Henry.....	Worcester
Wood, George Emilius .	London
Wood, Edward.....	Chichester

MINOR EXAMINATIONS.

Borland, John	Kilmarnock
Clarkson, James	Hull
Jackson, William.....	Retford
Masterman, George.....	London
Matthews, William.....	London
Nall, Thomas Mills	Bakewell
Rainey, Edward	Spilsby
Wood, Edward.....	Chichester

REGISTERED APPRENTICES.

APPRENTICES.	RESIDING WITH	TOWNS.
Atkins, Ernest	Mr. Atkins	Woolwich
Ayling, George G.	Mr. Phillipson	Chichester
Balkwill, Alfred P.	Messrs. Balkwill & Co.	Plymouth
Bartlett, Ebenezer	Mr. Mather.....	Reading

REGISTERED APPRENTICES, *continued.*

Beard, Henry J.	Mr. Keen.....	Hungerford
Beecham, Thomas	Mr. Farmar.....	London
Buckham, Thomas	Mr. Gilkes.....	Leominster
Clarke, William.....	Mr. Parker	Birmingham
Cocking, Samuel	Mr. Wainwright.....	Howden
Danies, Thomas	Mr. Lewis	London
Dulley, Joseph	Mr. Merrick	Northampton
Harper, Thomas	Mr. Cupiss	Diss
Hunter, George.....	Mr. Garbutt	Gateshead
Lees, James	Mr. Clarke	Richmond
Leigh, John James	Mr. Silvester	Knutsford
Limbert, John	Mr. Edwards	London
Mudd, Christopher	Mr. Greenwood	Harrogate
Naughton, William, L. J.	Mr. Owles	Yarmouth
Paine, Standen	Mr. Paine	Brighton
Ridley, Albert	Mr. Grimwade	Ipswich
Slack, James	Mr. Mills	Bakewell
Spreckley, George	Mr. Asling	Spalding
Stewart, Charles J.	Mr. Nicholson.....	London
Templeman, George D.	Mr. Strawson.....	Crewkerne
Thomas, John	Mr. Brend	Swansea
Twitchell, Richard	Mr. May	Stonehouse
Wicks, James	Mr. Keeling	Epsom
Wright, Charles	Mr. Wright.....	Manchester

ORIGINAL AND EXTRACTED ARTICLES.

ON THE PREPARATION OF VOLATILE OIL OF ROSES IN THE EAST.

BY DR. X. LANDERER,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmacien to the King of Greece, &c.

PHARMACOLOGISTS distinguish two varieties of essential oil of roses, namely, the Indian (*Oleum rosarum Indicum*), and that from the Levant (*Oleum rosarum Levanticum*).

These volatile oils are obtained from various species of rose, but principally from *Rosa sempervirens*, *R. moschata* and *R. centifolia*.

The methods by which the oil is extracted are various. In India the fresh petals are allowed to macerate in water in vessels exposed to the sun, and the oil which is found floating on the surface, is removed by decantation. Distillation with water is sometimes resorted to, the volatile oil being separated in a congealed state after exposure of the well saturated rose water in a cold place for several nights. The process adopted in China is somewhat different. The seeds of a species of *Digitalis* called *Sisama* are placed on layers of fresh roses, and after a contact of some days both are submitted to strong pressure; from a fatty oil thus obtained, the volatile oil of roses is separated by distillation.

To the foregoing descriptions, I am desirous of adding that of another method not so generally known, for the account of which I am indebted to a person who was engaged for several years in the manufacture of essential oil of roses at Damascus, and in some other parts of Asia Minor. It is a fact there well known that oil of roses prepared by ordinary distillation separates itself from the rose water in the form of a stearoptene. In order to obtain it liquid, transparent, and bright, as seen in commerce, it becomes needful to submit fresh roses to a dry distillation. The following is the process:—The rose-buds collected before sun-rise and deprived of the calyx and other green portions, are packed while yet fresh in a glass retort of the same description as those made at Cairo. The retort is placed in a salt-water bath, and a dry distillation is carried on, during

which process the heat is cautiously increased, care being always taken that the contents of the retort do not become scorched. In order to diminish the loss of heat, the retort is surrounded by coarse cloths. The product of this distillation consists of a watery liquid of a deep brown colour, upon which floats the oil of roses. The separation of the latter is effected in the usual way; the aqueous portion is also reserved, being highly esteemed in the East as a perfume. When separated, the oil is mixed with salt-water, by which it acquires a paler colour; packed in small vials it is carried to Constantinople, under the name of *Gul Jaghi*, or oil of roses.

[In English commerce the wholesale dealers distinguish no other variety of oil of roses than the Levantine, which is imported from Turkey and sold as Turkish Otto of Roses.]

INFUSION OF WALLFLOWERS (*Cheiranthus Cheiri*. Linn.)

BY MR. EDWARD VERNON.

BEING engaged over some slight experiments in the spring of last year, I discovered the rich carmine colour yielded by wall-flower petals when treated with boiling water and diluted sulphuric acid, in the same manner as the official infusion of roses. I do not imagine it of any great practical importance; but submit it to your judgment as a curious property, hitherto unnoticed, possessed by one of our most common indigenous plants. I kept some of the infusion with a little spirit added exposed to the sun's light and heat, through the whole of last summer, and it is now as unimpaired in colour and properties as the sample I enclose you. I have applied the following tests to it, and the results seem somewhat anomalous, as to the presence of tannin. The salts of the peroxide of iron strike a deep brownish green colour when added to the infusion. A strong solution of gelatine gives no precipitate. Disulphate of quinine dissolves, with the addition of a few drops of acid, producing the same opalescent tinge as in distilled water, but no precipitate. Spirituous and watery solutions of opium do not yield any precipitate or even cloudiness. The mineral acids have the same action as on infusion of roses, the nitric and hydrochloric slowly decolorising it. Solutions of potash, soda, and ammonia, added slightly in excess, strike a fine clear green colour. The metallic salts, &c. compatible with sulphuric acid, produce no decomposition.

I had thought from its rich persistent colour and the clear solution afforded with disulphate of quinine, that it might in some cases be more useful than infusion of roses; the taste, however, is certainly less agreeable. With regard to its therapeutical action, it is a mild tonic with a slight degree of warmth; and, doubtless, like all the cruciferae, contains a trace of nitrogen and sulphur, but in common with all species of that order, is perfectly harmless.

Should you or any of the readers of the *Pharmaceutical Journal* discover any practical utility in the above preparation, the announcement of the same would afford me great pleasure.

The following is the formula for the infusion:—

R The dried petals, 1 drachm
Diluted sulphuric acid, 45 minims
Boiling water, 12 ounces

Macerate for two hours and strain.

Middlesex Hospital, August 15th, 1851.

COTYLEDON ORBICULATA.

To the Editor of the Pharmaceutical Journal.

SIR,—IN Mr. Penney's notice of two species of cotyledon, in your number for the present month, it is stated that Dr. Pappa describes a plant (the *Cotyledon orbiculata*) of the same genus as the *Cotyledon umbilicus*, the leaves of which are stated to form an excellent application to hard corns.

In this neighbourhood the *Cotyledon umbilicus* is well known, and is in high repute with the country people as a remedy for corns and warts: many persons have informed me of the entire removal of corns after a few applications; and that the juice of the plant is a useful remedy in inflammatory swellings.

The house-leek (*Sempervivum tectorum*) of the crassulaceous order, is also famed for its application to corns and warts, and in common use mixed with cream for inflamed eyes.

Yours, respectfully,

CHARLES RODGERS.

Leominster, August 5, 1851.

ROOT OF ROUGH HAWKBIT (*Apargia hispida*. Willd.) SUBSTITUTED FOR TARAXACUM.

BY MR. E. W. GILES.

I HAVE before found occasion to remark upon the substitutions to which incautious Pharmacutists are subject at the hands of the herb collectors (*Vide Pharm. Journ.*, vol. x., p. 212.), and I have now to add another instance, which from apparent small inducement to fraud, the true plant being very abundant, together with the fact that the officinal portion is one where we are not accustomed to seek the most marked botanical distinctions, would be more likely to deceive the unsuspicious. A herbalist had been commissioned to collect a quantity of dandelion roots, which were delivered and paid for without any idea being entertained of their being anything but what was professed. A slight examination after they were washed showed that much the largest portion were spurious specimens, although from absence of flower it was not easy to determine the precise species; the leaf and peculiarities of the hairs upon it seem to declare them the roots of *Apargia hispida*; a supposition which I shall have the means of verifying by cultivating some individuals planted for the purpose.

The extent of the fraud is expressed in the fact that one hundred-weight of the roots contained only fifteen pounds of true dandelion, and I believe that it has been very generally practised in the neighbourhood by this collector, who has a good connexion, and carries on an especially large business in dandelions. It is not my object to show that this substitution occasions any mischief, the *Apargia* may even be the better of the two upon the principle popularly associated with medicines—that it is much more disagreeable; but if this is really the fact, we shall more certainly arrive at it by identifying effects with the proper cause than by assigning them to substances never administered.

It is perfectly easy to distinguish the true dandelion from the spurious when mixture is suspected. Both plants have runcinate leaves (not a very common feature in the order); but those of the *Apargia* are clothed with hairs, while the leaves of the *Leontodon Taraxacum* are smooth. The appearance of the roots differs in a much more striking degree: the true dandelion root being smooth skinned, tawny coloured, crisp or easily frangible, and containing at this season much milky juice; the root of the *Apargia* has a wrinkled cuticle, is pale coloured, tough, breaks with difficulty and rarely exhibits any milky juice at the fracture, it possesses a much more intense bitter, and they grow generally to a considerably larger size.

Clifton, Aug. 14th, 1851.

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(Continued from page 73).

INDIA.

No part of the Great Exhibition presents so many objects (several of them of a novel character) interesting to the Pharmaceutist as that devoted to the Indian Collection. Giving all due credit to the Honourable East India Company and to its agents in the East for the zeal and activity which they have manifested in laying

before the European world, regardless of expense, the riches of our Indian Possessions, we believe we are indebted in a very considerable degree to Dr. Royle for the completeness which the Indian Collection manifests. To his indefatigable labour, attention, and skill, we owe the preparation of very extensive lists of the various substances which the Company desired to be sent from India in order to illustrate the productive resources and industrial arts of that vast portion of the British Empire. And we trust that the Honourable Company will finish the good work which they have hitherto so ably carried on by providing a building where this magnificent collection may be permanently displayed in England, and by requesting Dr. Royle to prepare a properly illustrated catalogue.

We feel that it is quite impossible to do justice to the pharmacological portion of this collection in the brief notice which our limited space permits us to give; but we hope to be enabled to draw the attention of the exhibition visitors to the numerous interesting objects with which this collection abounds.

Chemical and Pharmaceutical Processes and Products.—Though the Arabs usually obtain credit for having given origin to Chemistry, there is every probability that the Hindoos were acquainted with all the substances and preparations which are mentioned in the work of Geber, the earliest Arabian chemist. The chemical substances enumerated by him are all met with in India: some of the names by which they are designated seem to be derived from the names of the same substances in India, as *sagimen*, from *sajji noon*, signifying soda salt. The acids also which the Arabs prepared, the Hindoos have processes for making and still continue to make, by methods as simple and with an apparatus as rude as in the most ancient times. The Arabs, moreover, have been proved to have been acquainted with, as they have quoted from, the most ancient Hindoo works on medicine, in which most of these chemical substances are mentioned. In the present day, however, the chemical products of the East are not of a nature to bear favourable comparison with those of the West. Few, therefore, of such have been sent for exhibition, and those only such as are employed in medicine; while others have been prepared in the East India Company's Dispensary in Calcutta, with the aid, of course, of European superintendence: of these the specimens of *sulphate of magnesia* are interesting, as made from the *magnesite*, or natural carbonate of magnesia of the Peninsula. The *hydrochlorate of ammonia* is obtained in considerable quantities from brick-kilns in which animal manure is used as a fuel.

Among the medicinal substances obtained from the vegetable kingdom, several are already well known in Europe. The *senna* and the *colocyynth* may be noticed as good in quality and coming from new sources, for what is commonly called *India senna* is the growth either of Arabia or of the east coast of Africa, being first imported into Bombay and thence sent to this country. The seeds of *Ipomea cærulea* and the roots of *Convolvulus Turpethum* are interesting as belonging to the same natural family as the jalap and scammony, and both used, as these are, as purgatives. The seeds of the *Ipomea cærulea* are, probably, the *hub-al-ni*, or *granum nil*, of the Arabs. They are much esteemed in India, as being quick and yet mild in their action. The *gambooge of Garcinia pictoria*, collected by Dr. Hugh Cleghorn, was first discovered many years ago. Dr. Christison has lately shown that both as a pigment and as a purgative it is very effective. It may be obtained in considerable quantities in the forests of Mysore and of Malabar.

The *chiretta* (*Agathota Chirayta*), of the family of Gentians, as a bitter tonic, is highly esteemed in all parts of the Bengal Presidency, especially in the form of cold infusion, as the *kreat* or *creyat* (*Justicia paniculata*) is in the Peninsula of India. This became celebrated as the basis of the *Droque amère*.

The oil of *Celastrus nutans* was exhibited by the late Dr. Malcolmson in the treatment of beriberi. The *Hemidesmus* is valued as an efficient substitute for sarsaparilla. The *Culotropis gigantea*, and another species, *C. Hamiltonii*, may be employed as substitutes for ipecacuanha, and are esteemed as alteratives in many skin diseases. Of the animal substances, the blistering beetle (*Mylabris Cichorei*) employed in India, is interesting as belonging to the same genus as that described by Dioscorides.

Several other medicinal substances, or which may be used as such, may be found among the spices and intoxicating drugs, gums, resins, and oils, and among astringents; and most of those known in India are contained in Dr. Royle's *Collection of Mineral, Vegetable, and Animal Substances useful in Medicine and the Arts, made in the Bazaars of India*. Specimens of *aconitina*, obtained by two processes from the roots of *Aconitum ferox*, imported from the Himalayas, are interesting, as difficulties have been experienced in obtaining the alkali. They are exhibited by Mr. W. Headland, of King's College.

Medicinal Substances.—The three presidencies, Bengal, Bombay, and Madras, have each furnished a considerable number of medicinal substances. A number of Java medicines have also been forwarded from Singapore.

1. FROM THE BENGAL PRESIDENCY.—In February last, the Central Committee at Calcutta drew up and printed a *List of Articles contributed from Bengal to the Exhibition of Works of Industry and Art of all Nations of 1851*. Large 8vo, pp. 60.

The following are the chief medicinal agents sent from this presidency to the Exhibition :—

Borax, refined ; nitric acid ; arsenious acid ; realgar ; orpiment ; mineral carbonate of soda ; sulphate of soda ; saltpetre ; sulphate of copper ; carbonate of lead ; litharge ; minium ; cinnabar ; corrosive sublimate ; magnesite ; magnesia sulphas ; hydrochlorate of ammonia.

Jabrung, fruit of (*Xanthoxylum*) used in medicine ; nux vomica from Assam.

The East India Company's Dispensary at Calcutta has furnished part of the following articles :—

Cannab., Ind. ext. and tinct. ; nux vomica, seed and bark ; *Aconitum ferox* ; *aconitum* tincture ; castor-oil seeds ; *Cassia Fistula* ; senna leaves ; gamboge ; *Ipomœa cœrulea* ; colocynth ; colocynth extract ; catechu ; assafœtida ; *Calotropis gigantea* ; *Calotropis* powdered ; Benzoic acid ; *Meloe trianthemæ* (*Mylabris Cichorei*, the native blister fly) from E. I. Company's Dispensary, Calcutta ; hill honey ; gall nuts ; oils of cubebs and croton ; mustard oil ; grass oil ; gurjun oil (*Dipterocarpus lœvis*) ; medicinal opium ; morphia ; m. hydrochloras et acetas ; hyoscyami fol. ; hyoscyami extract. et tinctura ; *Stramouli* sem. ; *Cannabis indica* ; *Malkungnee*, or *Celastrus nutans* ; *Myrica sapida* (bark of the) ; *Anuntamool* (*Hemidesmus indicus*), or substitute for *sarsaparilla* ; *Momordica*, sp. ; mishmee bitter or mishmee teeta (*Coptis teeta*) ; *Gmelina arborea* ; *Echites antidysenterica* ; *Menispermum cordifolium* ; *Cyperus* munga ; *Helicteres Isora* ; *Sphæranthus*, sp. moodie ; *Cheretta* (*Agathotes chirayta*) ; *cheretta* extract and tincture ; *Xanthoxyli*, sp. *Budrunge Tejbaul* ; *Rheum emodi* ; *Fœtidia Mauritiana* ? ; *Pongamia arborea* ; *Swietenia febrifuga* ; *Althæa*, sp. *Khudmee* ; *Serratula* sp. *Kasnee* ; *Semecarpus Anacardium* ; *Gardenia dumetorum* ; *Fumaria officinalis* ; *Adiantum cordatum* ; *Barringtonia acutangula* ; *Cordia grandiflora* ; *Momordica muricata* ; *Embelia robusta* ; *Linaria* sp. ; *Sterculia ramosa* ; *Asparagus officinalis* ; *Cucumis*, sp. *Kuchree* ; *Plumbago zeylanica* ; *Cœsalpinia Bonducella* ; *Tribulus lanuginosus* ; *Argemone Mexicana* ; *Punica granatum*, rind of the fruit and bark of the root ; *Tejraj*, *Bajraj*, *Kamraj*, *Doobraj*, and *Madhooraj*, from *Bhagulpore* ; *Podocarpus nana* ? ; *Acorus Calamus* ; *Choulmoogra odorata*, *Choulmoogra* ; camphor from Borneo ; cubebs.

The following medicinal substances, used by the natives of Arrakan, are communicated with their local names and supposed properties. They are nearly all inert articles, and of common occurrence throughout Bengal :—

Guararan, a carminative ; *Shuedelai*, a powder for sores ; *Danzagoophroo*, tonic alterative ; *Gnapoongsay*, a carminative ; *Mahaga*, drastic purgative ; *Toungyen Khat*, astringent ; *Thamaga*, carminative and tonic ; *Thetyeng*, tonic aperient ; *Thabeych*, carminative ; *Kamaungkha*, refrigerant ; *Kankyautner*, tonic aperient ; *Let-tophyee*, astringent ; *Nwasheagyer*, sedative ; *Kokkho*, tonic aperient ; *Hting*, tonic ; *Pwabeb*, expectorant ; *Thesenggyee*, warm purgative ; *Thaweng poukphyee*, expectorant ; *Teermakhan*, tonic ; *Tabwot*, a carminative ; *Maor*, refrigerant ; *Oayet*, refrigerant ; *Touksha*, carminative ; *Oobathaga*, aperient ; *Toushouk*, tonic ; *Kyoapmyet*, febrifuge ; *Nanloggyng*, tonic aperient ; *Tsengthamanway*, laxative ; *Pouknet*, tonic and carminative ; *Tabatsay*, febrifuge ; *Karvee*, tonic ; *Thanly etgnai*, laxative ; *Wow-oo*, febrifuge.

Java medicines forwarded from Singapore.

2. FROM BOMBAY.—Oondee oil (*Tanna*). *Calophyllum inophyllum*, oil expressed from the nut, used as a stimulant externally and internally. Imported from Somali coast.

Kurunj oil (*Tanna*). *Pongamia glabra*, oil expressed from nut ; used externally as a stimulant.

3. FROM MADRAS.—*Calabunda* (*Aloe perfoliata*) from Vizagapatam.

Gamboge, from Canara ; ditto, collected by Dr. Cleghorn.

Hemidesmus indicus ; *Convolvulus Turpethum* root and powder ; *Clitoria ternatea* seed and powder ; *Cannabis indica* (flowering tops).

Specimens of *Mylabris Cichorei* ; *Pulvis mylabris cichorei* ; *Tinctura cannabis sativæ* ; *Hoya viridiflora* (*Asclepias vomitoria*) ; *Hymenodictyon utile* ; *Soymida febrifuga*.

fuga; dry bark of the mullay or jungle margosa; dry bark of the vapum or margosa trees; croton seeds.

Napaula oil (*Croton tiglium*) from Vizagapatam and Ganjam.

Justicia paniculata (creyat); specimens of salt, from Nellore.

A few of the articles of the Indian *Materia Medica* deserve especial comment.

1. *Catechu*.—Of this substance there are five sorts in the collection, with a log of the wood of *Acacia Catechu*. The five sorts of catechu are the following: 1. Pale dull catechu in large square cakes, the *cachou en manière d'écorce d'arbre* of A. Jussieu; 2. Dark brown catechu from Calicut, in circular flat cakes, covered on one side with paddy husks, and agreeing with the so-called Colombo or Ceylon catechu; 3. Gambir in cubical cakes, forming the *terra japonica* of tanners; 4. Tilla khuer; 5. Shaikpore khuer. The two latter sorts are identical or nearly so, though bearing different names. They are in dark coloured irregular shaped lumps, and are from the districts surrounding Calcutta.

In the Bengal Catalogue three kinds of extract of the *Acacia Catechu* are mentioned as having been collected; they are Shaikpore khuer, Tilla khuer, and Jumackpore khuer. From the districts surrounding Calcutta.

Attached to the gambir is the following statement:

"The inspissated juice of the sprigs and leaves of a plant* somewhat resembling the myrtle (the *Ficus uncatas*, Rumphius) extracted by boiling. Formerly this article was chiefly used as a masticatory with siri and betel-nut by the natives, but since the establishment of Singapore, the cultivation of the plant has become greatly extended, and gambir now forms the bulk of the cargoes of ships for England, where it is much used for tanning purposes."

2. *Grass Oil*.—There are several sorts of oil called "grass-oil," in the collection; they vary both in colour and odour. Whether these differences arise from differences in the plants used in distillation, or from variations in the mode of preparation, is uncertain. One sort with a greenish tinge, is marked "Rousuh oil," and is identical in odour with the "Oil of Geranium from Mecca," of the Turkish collection. It is the produce of Dr. Royle's *Andropogon Calamus aromaticus*.

3. *Opium*.—The history and manufacture of Indian opium is very completely illustrated by a set of water colour drawings, representing the process of the opium cultivation and manufacture at Patna, by the various instruments and utensils employed in the cultivation, extraction, and preparation of opium, by a collection of poppy heads with the incisions made into them for the extraction of opium, and by numerous specimens of opium. We shall return to this subject on a future occasion.

4. *Isinglass*.—*Polynemus plebeius*, the fish from which the East Indian isinglass is obtained; contributed by Dr. Walker, from Calcutta. Isinglass obtained therefrom presented by Dr. J. McClelland; it was prepared under his direction by Mr. Scott, of the E. C. Dispensary, and will, it is expected, be found to be exempt from the ordinary impurities supposed to belong to East India isinglass. Another fish from Arrakan affording isinglass. Fish maws (swimming bladders) from the Tenasserim provinces, and also from Sumatra.

5. *Edible Bird's Nests*.—First quality from Sambava, east of Java; second quality from Borneo; third quality from Borneo (for details respecting these, see *Pharmaceutical Journal*, vol. viii., p. 528).

6. *Trepang from Borneo*.—A radiate animal called Beche-de-mer, or sea-slug of the Holothuria tribe, collected in quantities throughout the Indian Archipelago, especially among the islands: forwarded from Singapore.

7. *Bees' Wax*.—Bees' wax from the Indian Archipelago, from Bangalopore, in the division of Patna, and from insects indigenous to the Tenasserim provinces. The bee of the Indian Archipelago does not make its nests in hives as in Europe, but suspends it from the branch of a tree, in which position they may be seen forming masses of considerable bulk. Certain trees become favourites, and are selected by them yearly for many generations, although often disturbed by the taking of their nests. These trees become private property among the eastern tribes, and are handed down from father to son.

8. *Musk*.—Musk in bamboo bottle; in pods and grain from the Nepaul states, and in pods from Assam. Blistering beetle, *Mylabris Cichorii* (also called *Meloe trianthemæ*).

9. *Agar-Agar*.—(*Plocaria candida*?) First quality obtained from Malacca. A sort of

* The *Nauclaea Gambir* of botanists.—ED.

edible sea-weed, which grows in the rocks that are covered by the tide. It is much used for making a kind of jelly, which is highly esteemed both by Europeans and natives for the delicacy of its flavour. Second quality, obtained from Macassar (Celebes). It is an edible sea-weed, collected on the submerged banks in the neighbourhood of Macassar by the Bajou Lant, or sea gypsies, for exportation to China. Also another sort obtained at Singapore, and collected on the reefs and submerged ledges in the vicinity of Singapore, and constitutes the bulk of the cargoes of the Chinese junks on their return voyage. It is much used there as a size for stiffening silks and for making jellies.—(From Singapore.)

10. *Senna*.—A fine specimen of Indian senna grown by Dr. Gibson, is contained in the collection.

SPAIN.

BESIDES the notices of the products of Spain contained in the official Catalogue, published under the authority of the Royal Commission, a very interesting pamphlet on them has been published by M. Ramon la Sagra, the Spanish Commissioner in London, under the title of "*Notes sur les Produits Espagnols envoyés à l'Exposition de Londres suivies de quelques Considérations sur l'état présent et l'avenir de l'Industrie Espagnole et d'un Exposé Methodique des mêmes produits*," 8vo, pp. 88, 1851. From these sources, as well as from personal examination (where it was possible) of the objects themselves, we have drawn the following notices of Spanish products appertaining to Pharmacy. We may premise, however, that we believe with M. Ramon de la Sagra, that the specimens sent on behalf of Spain and her colonies to the Exhibition, give only a faint idea of her natural riches. Except some fine minerals, the raw materials are small and badly selected. For example, though Spain has the finest mines of quicksilver in the world, and of great geological interest, the illustrative series sent to the Exhibition, are fitted rather for the cabinet of a student, than to give to the visitors of the Exhibition an approximative idea of the wonders of Almaden.

SALTS.—The soil of Spain produces a great variety of salts useful in domestic and rural economy, in the arts, and in medicine.

1. *Glauberite, or Sulphate of Soda*.—This is very abundant in the province of Burgos. It is found in beds of clay and sulphate of lime, in the hills which border the river Tiron, a tributary of the Ebro. It is extracted by solution in water, evaporation, and crystallization. When the crystallized salt has been calcined, it is called *anhydrous sulphate*. In the first state it is sold at three rials the arroba, and in the second at double the price; that is to say, at 3fr. 25c., and at 6fr. 50c. the quintal of 48 kilogrammes.

There exist, also, in the same country, saline springs, of the density of 7° or 8° of Baumé, which flow from the hills, and which contain sulphate of soda in solution. They are found near Cervera, in Catalonia. The salt which they yield, is sold at eight rials, or about 2fr. the quintal.

The extraction of *glauberite* is recent. At the present time, the consumption of sulphate of soda is almost exclusively limited to a glass manufactory in the village of Rozas, in the province of Santander.

Inspector of Mines of the District of Burgos.—1. Glauberite from the mines of the town of Cerezo.—2. Crystallized sulphate of soda.—3. Anhydrous or calcined sulphate from Glauberite.

Angula, I., Barcelona.—Sulphate of soda extracted from running waters in the immediate neighbourhood of Cervera.

2. *Common Salt*.—The specimens sent to the Exhibition are from the provinces of Almeria and from the brine-springs of Añana, in the province of Alava. There are some fine specimens of sal gem from Cordova, but the series is not so rich and varied as it might have been.

The Anana Salt Works, Alava.—Common salt; Native crystallized salt.

Maisterra, M. Lorea.—Native salt in crystals.

Elias, M., Barcelona.—Sal gem.

3. *Carbonate of Soda*.—It is well known that many parts of the southern coast of Spain and the Canary Isles produce *Salsola Soda*, and other species from which crystallized carbonate of soda has been obtained from time immemorial. But this branch of Spanish industry has received a mortal blow, by the introduction into commerce of artificial soda; though the manufactories near the districts where natural soda (*barilla*) is produced in abundance, continue to employ this product notwithstanding its undoubted disadvantages for the saponification of oils.

The collection contains *barilla* from Alicante, Murcia, Barcelona, Grenada, the Canary Isles, &c.

The price for the rough salts is 18 rials, or nearly 5 fr. the quintal. The soda of Murcia, as well as that of Barcelona, fetches 40 rials or 11 fr.

There is also a specimen of native carbonate of soda found in the Island of Teneriffe, on a bed, which is almost horizontal, at the base of the Peak, or Volcano de Teide.

4. *Alum*.—Sulphate of alumina is manufactured in various places. It is obtained from aluminous schists, as those of Murcia (from whence a specimen of refined alum is sent.) The price is fifty rials, or thirteen francs the quintal.

Maurandy, D. A. I., Carthage.—Alum manufactured by the exhibitor.

5. *Carbonate of Potash* is made in Spain by well known methods. The calcined potash of Almeria is sold at 120 reals the quintal, and in the rough state at eighty rials.

6. *Nitrate of Potash* is also obtained in Almeria, where it is sold at seventy rials the arroba. It is extremely abundant in Zaragoza, where it is found every where in a state of efflorescence.

Pardo y Bartolini, Zaragoza.—Nitrate.

Elias, M., Barcelona.—Nitrate.

EARTHS.—The only earthy substance which we think it requisite to notice is *Phosphorite*, or native phosphate of lime of Logrozan, the province of Caceres, in the old province of Estramadura. The great value of this substance to the agriculturist for fertilizing poor and exhausted soils, led to its examination a few years ago by Dr. Daubeny. It does not appear, however, that any extended use is made of this mineral in Spain, for the Spanish commissioner observes of it, that "this rare substance, like many others, yet awaits the industrial future of Spain."

Concha, A., Caceres.—Phosphorite of Estremadura.

MERCURY.—Mercury is found in different parts of Spain; and specimens have been sent to the Exhibition from the celebrated mines of Almaden, of the Asturias, and of Almeria, on the coast of Andalusia.

The Almaden series would be instructive if the specimens were of sufficient magnitude. They show the mercury in the different states in which it is found, and the earthy and fossilized substances accompanying it, and which are found in the upper silurian formation. We have *Calymene Tristani* and *Spirifer trigonalis*, with other bivalves of the Devonian rocks.

The mercury is found in its native state, and also combined with sulphur. There are specimens of crystallized cinnabar, of sand-stones (*grès*) impregnated with cinnabar, of corneous mercury, in all amounting to twenty-six specimens, most interesting to the geologist for illustrating the mercury district of Spain.

For some few years past mines of cinnabar have been worked in Asturias. The minerals of Tijola, of Bayargue, in the province of Almeria, have hitherto been but little studied.

The following list of the mercury minerals is taken from the Commissioner's pamphlet:—

ALMADEN SERIES (La Mancha).

1. *Argillaceous schist*, from the lower Silurian rocks.
2. *Calymene Tristani*, ditto.
3. *Sandstone (grès)* with *Spirifer trigonalis*, and other bivalves of the Devonian rocks.
4. *Gomatites*, and some other fossils, ditto.
5. *Euphotide*, adjoining the gangue of the Conception mine.
6. *Iron pyrites*, on which is found native mercury.
7. *Sulphuret of mercury* and *native mercury*, from the Conception mine.
8. *Crystallized baryta*, with *native mercury*, from the same mine.
9. *Crystallized carbonate of lime*, from the same mine.
10. *Sulphuret of Mercury*, from the mine of Valdeazogues.
11. *Sandstone (grès)* impregnated with cinnabar, from the same.
12. *Corneous mercury* of the same mine.
13. *Breccia*, of the same.
14. *Quarcite*, with cinnabar.
15. *Quarcite* of the upper Silurian formation, which constitutes the beds of the Almaden mines.
16. *Sandstone (grès foncé)*, with cinnabar and globules of native mercury.
17. *Sandstone (grès)* with crystallized cinnabar.
18. *Sulphuret of Mercury*.
19. *Plate* of polished cinnabar.
20. *Breccia* with crystals of calcareous spar and veins of cinnabar.

ALMERIA.

21. *Sulphuret of mercury*, of Tijola.
- " " of Bayargue.

ASTURIAS.

23. *Sulphuret of Mercury*, from the mine of the Asturian Mining Society.

24. *Iditto*, from Mierca.

25. *Iditto*, from Lena.

CHEMICALS.—There are but few Spanish chemicals in the Exhibition, although chemicals are manufactured in various cities of Spain, especially in Barcelona, from six manufactories of which numerous products were sent to the last Exposition at Madrid.

Ambrosio Sauto, pharmacien, Matanzas, Isle of Cuba.—Salts of quinine, of morphia, and of strychnia; mannite; sulphate of cadmium, cyanide of potassium, &c.

I. Canales, Malaga.—Crystallized citric acid, essence of lemon (sold at 22 rials per lb.—12 fr. the kilogramme).

F. Bescanias, Corunna.—Cream of tartar (bitartrate of potash).

MEDICINAL PLANTS.—These are very numerous, and come from Oviédo, Léon, Galicia, Huesca, Zamora, Zaragoza, Segovia, Barcelona, Malaga, Cordova, Seville, Grenada, Gerone, Vitoria, the Balearic Isles, and the Canaries. As they are obtained in abundance and at a low price, they might become articles of commerce, provided there were ready means of transport for them.

Academy of Medicine and Surgery, Zaragoza.—Lichen Islandicus, Lichen pulmonalis, *Salvia officinalis*, *Digitalis purpurea*, *Anthemis nobilis*, *Gentiana lutea*, *Valeriana officinalis*, *Aristolochia rotunda*, *Arnica montana*, *Atropa Belladonna*, *Sarsaparilla*, *Liquorice*.

[By other parties and from other parts of Spain a considerable number of unimportant medicinal plants have been sent, which we think it unnecessary to particularize.]

PHARMACEUTICAL PREPARATIONS.—These are not numerous.

From Oviédo, Asturias.—Extracts of aconite, belladonna, lettuce, foxglove, orange-peel, and of sarsaparilla, honey of sarsaparilla, prepared sarsaparilla.

GUMS, RESINS, &c.—These are few in number.

Flores, Calderon, & Co., Burgos.—Resin, and oil of turpentine.

Huelva.—Gum of the plum and almond trees (1 rial per lb.)

CORK.—Three provinces have sent cork in sheets or layers, and also cut as stoppers (corks and bungs) namely, Gerone, Huelva, and Seville. In the first of these places, the commerce in cork is very considerable. The cork-oak (*Quercus Suber*) which produces it, grows on the whole of the shores, and on the declivities of the Pyrenees.

The price of cork in layers or sheets, is 300 rials or 78 francs the quintal. Cut corks sell at different prices, according to their sizes. Champagne corks cost 500 rials, or 135 francs per thousand. Corks for Bordeaux wine 68 frs.; those sent to England, from 54 to 25 frs., according to their size; lastly, those used in perfumery, sell at from 5 to 8 frs. per thousand. Cork in layers, bought in the trees, costs at Huelva from 5 to 8 frs. the quintal.

TURKEY.

In the Turkish collection at the Exhibition, will be found a number of medicinal substances, a few only of which require to be noticed here. Their quality is in general inferior, and in some instances they are wrongly named.

OPIMUM.—Seven varieties of opium are found in the collection, but none of them appears to us to be of first-rate quality; at least there is not one in a good state of preservation. The following are the sorts:—

1. *Tripoli*.—Smell not like that of opium.

2. *Cara Hissah*.—This has a proper opium odour.

3. *Koniah*.—Has the opium smell, but is mouldy.

4. *Adin*.—Is shiny, somewhat like Constantinople opium. It has a proper opium odour.

5. *Ushak*.—Of inferior quality.

6. *Sparta*.

7. *Ismia*.—Bad.

SCAMMONY.—There are three varieties of scammony in the collection.

1. *Davus*, Asia Minor.—In small pieces or coarse powder. Dirty, fetid, and very bad quality.

2. *Koniah*.—In pieces which are obviously adulterated: small chalk-like specks being very obvious on the fractured surfaces.

3. *Smyrna*. In appearance this resembles virgin scammony; but we have had no opportunity of testing it.

OIL OF ROSES from Adrianople.—This was pale yellow and quite fluid on the day (a hot one) on which we examined it.

ROSE WATER.—Four specimens are contained in the collection. They are respectively marked Kezanlik, Philipopoli, Damascus, and Candia. The second appeared to us to possess the best odour, but they were all of inferior quality.

OIL OF GERANIUM.—Mecca. The colour of this oil is golden yellow. It is used in the East, and is imported into England for adulterating otto of roses. There is no reason, however, to suppose that it is obtained from any species of geranium; the name of "oil of geranium" being given to it on account of its odour being like that of the rose geranium. Dr. Pereira (*Materia Medica*, vol. ii., part i., p. 1025) observes that in odour it is like the grass-oil of India; and on comparing the Turkish oil of geranium with the "Rousuh oil" (oil of *Andropogon Calamus aromaticus*) in the Indian collection, the two oils appeared to be identical in odour. It is probable, therefore, that the so-called Mecca oil of geranium is, in fact, the grass-oil of India carried to Arabia by the Red Sea.

OTHER VOLATILE OILS.—Besides the volatile oils already noticed there is a considerable number of others, mostly of inferior quality: as of lavender (bad), orange leaves, cedar from Salonica, &c. &c.

PETROLEUM.—There are three specimens of black mineral resin, from Moldavia, and one of black mineral naphtha, from Damascus.

WESTERN AFRICA.

The substances interesting to the Pharmaceutist, which are brought from this part of the world, are few in number. They are chiefly arrow-root, palm-oil, ginger, ground nuts, and pod pepper. To which may be added grains of paradise.

The arrow-root is the produce of *Maranta arundinacea*, cultivated by the liberated Africans captured from slavery. Although a genuine article the fucula is somewhat inferior in colour to that imported from the West Indies; but its price (from 8d. to 10d. per lb.) is considerably less. It is well adapted for pauper establishments, hospitals, &c.

The ground nuts (*Arachis hypogaea*) are extensively imported for pressing—the oil being largely used as a substitute for olive oil.

The pod-pepper imported from this part of the world is either *Capsicum fastigiatum* or *C. frutescens*. It is commonly called Guinea pepper.

Hutton, W. B. and Sons.—Fruit and seeds of the Guinea palm (*Elæis guineensis*), oil of the fruit (palm oil), and oil of the seeds or kernels, kernel oil soap, ground nut (*Arachis hypogaea*) nut oil and soap.

Weston Warwick, 78, Gracechurch Street.—Rhizome or root of the *Maranta arundinacea* and its fucula, commonly called African arrow-root; palm oil; bennie seed (*Sesamum indicum*?) and ground nuts; Shea butter; ginger; pod-pepper (*Capsicum fastigiatum*) and cayenne pepper; gum copal.

Mac William, M.D., F.R.S., Principal Medical Officer of the late Expedition to the Niger.—Seeds of the *Bassia Parkii*, and their fat called Shea butter, from Egga, River Niger.

(To be continued.)

ON THE ANTIARIS SACCIDORA, OR SACK-TREE

BY N. A. DALZELL, ESQ., M.A.

(Nat. Ord. *Artocarpeæ*.)

Antiaris saccidora, Dalz.—*Lepurandra saccidora*, Nimmo, Plants of Bombay, p. 193.

Crescit in regno Warreensi, ad pedem jugi Syhadrensis; fructum maturum habet Januario.

This is a gigantic tree, with a trunk eighteen feet in circumference at the base. On wounding the fruit, a milky viscid fluid exudes in considerable quantity, which shortly hardens into the appearance and consistence of bees' wax, but eventually becomes black and shining. The inner bark of the tree is composed of very strong tenacious fibres, and seems excellently adapted for the manufacture of cordage and mattings. Mr. Nimmo speaks of this tree as being discovered by Dr. Lush at Kandalla in 1837, where it grows in deep ravines, and he adds, "It is common in the jungles near Coorg, where the people manufacture very curious sacks, and by a most simple process, which will hardly be credited in Europe. A branch is cut, corresponding to the length and breadth of the sack wanted. It is soaked a little and then beaten with clubs, until the liber separates from the wood. This done, the sack formed of the bark is turned inside out until the wood is sawed off, with the exception of a small piece left at the bottom of the sack, and which is carefully left

untouched. These sacks are in general use among the villagers for carrying rice, and are sold for about six annas each. Some of them have been sent to England as curiosities* by Mr. P. Ewart. The nuts are intensely bitter, and contain an azotized principle, which may prove an active medical agent."—The natives call the tree "*Juzoogy*," others "*Kurwut*," but this last name is applied to many kinds of trees with scabrous leaves.—*Hooker's Journ. of Botany*.

EXAMINATION OF THE SAP OF THE SUGAR MAPLE TREE,
THE *ACER SACCHARINUM* OF LINNÆUS,
WITH AN ACCOUNT OF THE PREPARATION OF THE SUGAR.

BY GEORGE D. GIBB, M.D., &c.

Lecturer in the Institutes of Medicine, Montreal.

ONE of the most noble trees, and one of the most common and well known in this country is the *Maple*. It may truly be designated the pride of our forests, contrasting strongly as it does with its variegated leaf, with the stately and lofty pine, which is equally abundant and numerous. The maple-leaf has not been inaptly chosen as the national emblem of the French Canadian, and is the badge worn by the members of the Society of St. Jean Baptiste, the patron saint of the Franco-Canadians.

A few observations upon the sap and sugar obtained from the maple, which were suggested by an experimental examination of the sap itself, I venture to hope may not prove uninteresting.

Professor Lindley mentions three genera and about sixty species belonging to the natural order *Aceraceæ*. These are spread over Europe, the temperate parts of Asia, the north of India, and North America. The order is unknown in Africa and the southern hemisphere. "The species are only known for the sugary sap of the *Acer Saccharinum*, and others, from which sugar is extracted in abundance, and for their light useful timber."†

Canada and the United States (especially New York, Pennsylvania, Western Counties of Middle States, and the banks of the Ohio,‡) abound in the greater number of the species mentioned, and they extend further northwards as far as the Hudson's Bay Company's territories.

In Canada the hard, rock, or bird's-eye maple, and the soft or curly maple are well known. The true sugar maple, the *Acer saccharinum* of Linnæus, is the tree that especially yields the largest quantity of sap, and furnishes the best sugar. This tree is the one commonly known as the hard maple, and is that which furnishes the best fire-wood. Large tracts of land in the Ottawa district are covered with it; it is found in great numbers in the eastern townships, where large forests, miles in extent, contain nothing else, and in other places it is mixed with various trees; there is scarcely a spot in Lower Canada where it is not to be met with, and in every place is the manufacture of sugar known and practised.

Captain Marryatt has stated that there were trees enough on the shores of Lakes Huron and Superior to supply the whole world with sugar.

Mr. James E. Campbell, who has had much experience on this subject, informs me, that the manufacture of a syrup from the maple tree was known to the Indians at the time the country was first settled by the French; and it is supposed, on good authority, that the knowledge of its manufacture was first obtained from them. To this day, in the north-west territories belonging to the Hudson's Bay Company, this sugar is made by the squaws in the form of little round pallets, made by pouring the thickened syrup on chips, flattening them with the hand, and leaving the mark of the three fingers on its surface.

In the United States the manufacture of the sugar was first attempted about 1752, by some farmers of New England, as a branch of rural economy. This gradually spread wherever the tree was known. Now it forms an article of food throughout a large part of the country districts of the Lower Province, and even in many parts of the Upper, more particularly along the banks of the Ottawa. When travelling in that direction I have been furnished with it, in a crushed form, for my

* Two of these curious sacks, sent by Mr. Nimmo, are deposited in the Museum of the Royal Botanic Gardens of Kew.

† Lindley's *Vegetable Kingdom*.

‡ Ure's *Dictionary of Arts and Manufactures*.

tea; and on asking if muscovado sugar would not be cheaper and preferable, was told that almost every farmer prepares annually sugar enough for the year's consumption of his family, and often has a surplus quantity for sale. And as to its cheapness, it is sold from 2d. to 3½d. per pound, sometimes lower, whilst very common Muscovado can never be bought for less than 4½d. to 5d. per pound. It has some advantages also over Muscovado, of which I shall presently speak, and is superior to it when properly made.

In the month of March I procured some fresh sap from a hard maple-tree, and resolved to apply the various means for detecting the presence of sugar, and to estimate the amount yielded in a given quantity.

Its colour was that of pure water, with the merest shade of opalinity. The taste was moderately sweet, and resembling *eau sucrée* of the French. Its specific gravity 1.114, at the temperature of 60° Fahrenheit. Neutral, possessing neither an alkaline nor acid reaction.

Five fluid ounces, evaporated to dryness in a glass vessel, yielded ninety-four grains of residue, of a pale straw colour and perfectly transparent, equal to 376 grains, or a little over three-quarters of an ounce to the pint of twenty fluid ounces. The residue was almost entirely pure sugar, and contained traces of chlorides, phosphates, and sulphates.

From the lowness of the specific gravity in comparison to the fluid of diabetes mellitus, I did not expect that the results would have been marked in the application of reagents, but the following were those obtained:—

Moore's Test.—Equal parts of the sap and caustic potass were boiled for about two minutes; the fluid assumed a dark oily yellow or sherry colour, which it retained. This "dark sherry colour" will at any time result by boiling grape sugar, potash and distilled water, as shown by experiments in the *Lancet* by Dr. Hassall.†

Trommer's Test.—A solution of the sulphate of copper was added sufficiently to give the sap a light blue colour, a deposit of phosphate of copper occurred;‡ caustic potass was then added in excess, when a heavy precipitate of hydrated oxide of copper fell, which became re-dissolved in the excess of alkali, forming a dark-blue solution. On heating to ebullition, a most marked deposit of red sub-oxide of copper fell.

Cappezzuoli's Test.—A few grains of blue hydrated oxide of copper were added to some of the sap, in a conical glass vessel, and the fluid rendered alkaline by adding caustic potass. The fluid assumed a reddish tinge, and after the lapse of a few hours the edge of the deposit of oxide obtained a yellow colour, which extended throughout the entire mass from the reduction of the oxide to a metallic state.

Maumene's Test.—A few drops of sap were placed on a strip of white merino that had been previously acted upon by a strong solution of chloride of tin, and then dried. On exposing it to a temperature of from 260° to 300° Fahrenheit, it immediately produced a dark-brown spot. This is one of the most convenient and delicate tests that has been as yet discovered, and one of easy application, for strips of this saturated cloth may be carried about like the ordinary test papers. "By the help of this test the presence of sugar in the urine can be readily detected. Ten drops of diabetic urine, diffused in half a pint of water, would in this way yield a brownish-black spot. Ordinary urine, urea and uric acid, produce no result of this kind."§

Nitrate of Silver Test.—On adding a few drops of a solution of nitrate of silver, nothing was observed, but on adding some caustic ammonia, a white precipitate was formed, which was reduced by a very slight heat, the metallic silver attaching itself to the surface of the vessel.

All these tests were satisfactory and clearly demonstrated the presence of sugar. Some specimens of sap, however, are richer than others in the amount of sugar present, and consequently possess a higher specific gravity. This fact is well known to some of the sugar-makers.

On reference to many standard works of authority,¶ I find quotations from a paper published many years ago in the American Philosophical Society's Transac-

† March 8, 1851.

‡ Traces of phosphates were present.

§ *London Medical Gazette*, April 5, 1850.

¶ *Ure's Dictionary of Chemistry*; Thomson's *Organic Chemistry*; Ure's *Dictionary of Arts and Manufactures*.

tions,* by Dr. Rush, giving an account of the sugar maple tree. All the tests here applied were at that time unknown, and although I have been unable to refer to the original paper, I find that no examination of the sap itself was made.

Dr. Rush has described the process of manufacture in the States, which is a very simple one, as practised by the farmers.

In Canada the sap is procured and manufactured into sugar as follows :—

The tree is bored on its south side with an augur, or a brace and bit, or a gouge, or rounded chisel, until the hole is nearly two inches deep, in some cases it is much less, the diameter being from $\frac{1}{4}$ to $1\frac{1}{2}$ inches. Care must be taken that the alburnum or white bark is not penetrated more than half an inch, as experience has proved that a greater discharge of sap takes place at this depth than any other. It is neatly cleaned out, and a small and thin pine or cedar spile or spout, is then tightly introduced to direct the flow of sap into the bucket or trough. In some parts of Lower Canada, instead of boring a hole, the *habitans* chop a pretty large opening with a hatchet, this would seem to answer well in obtaining the sap, but it very much injures the tree and frequently destroys it. When the sap ceases running on the south side, the tree is again bored on the east or west side, seldom on the north side, as that side furnishes but a small quantity of sap, supposed to be owing to the want of a warm atmosphere from that quarter.

Some trees have two openings made at the same time, a few inches from each other; others have holes in the most convenient place, without reference to the points of the compass.

Mr. Dillon, of Longue Pointe, who has kindly replied to a communication of mine upon the subject, states that there are two kinds of dripper besides the spout, one made of a piece of bent hoop, and the other a flat piece of cedar; the former made so as to fit the incision of a gouge, and the latter driven into the tree after tapping with an axe. He considers the tapping by the brace and bit as preferable to either the gouge or the axe, as the opening may be plugged at any time to prevent the entrance of air, which might injure the tree.

The age of the tree tapped is uncertain, but the diameter of the trunk must not be less than nine or ten inches; it attains its full growth in about twenty years, and is then from two to three feet in diameter.

Dr. Rush states that tapping does not injure the tree, but, on the contrary, it affords more syrup, and of a better quality the oftener it is tapped. A single tree, he says, has not only survived, but flourished after tapping for forty years. This fact is confirmed by Mr. Campbell, who informs me that in a forest of maple trees, where the trees are even full grown, when tapped for the first time, the sap is large in quantity, not so sweet, and does not yield, on the average, scarcely two pounds per tree; but the oftener tapping is performed, the stronger and richer the sap becomes, the tree seems to improve, and the amount of sugar yielded is very much larger. I have seen trees, full grown, quite healthy and flourishing, that have been tapped for upwards of sixty years, and apparently uninjured.

The sap scarcely varies in colour during the time it is running from the tree; it is clear and limpid, inclining somewhat to amber or straw colour. It is, however, very often perfectly colourless like water, and this will depend upon the presence of more or less sugar in solution; the darker the colour the higher the specific gravity, the sweeter the sap, and consequent richness in sugar. The richness and the quantity of the sap are influenced also by a variety of causes. A very important one is moisture of the earth; if the tree is on a hard, dry, and elevated soil, the sap will not be so abundant, but it will be richer and of a yellow colour; if it is in a low marshy situation, there will be a greater flow of sap, but very poor in its amount of sugar. Richer sap is also yielded in cold frosty weather than in damp rainy weather. Hence the season chosen for tapping the trees are the months of February and March, before the changes in the seasons occur. When the nights freeze hard and the sun comes out hot during the day, the farmers anticipate a good flow of rich sap; but if the night is warm with a warm wind in day time, the sap they say is spoiled. A sudden thaw, such as occurred this last spring, ruins the sugar making. This was much felt in the eastern townships.

Each tree yields on an average about five or six buckets of sap, and a bucket-full of sap is estimated to yield over half a pound of sugar.† Mr. Campbell states that the sap from an old tree that has been tapped eighteen or twenty years, will yield

* Vol. iii., p. 64.

† An ordinary bucket contains $2\frac{1}{2}$ to three gallons.

a pound a bucket. Many persons are satisfied with an average of three pounds of sugar from each tree, although there are instances, as Dr. Rush states, of as much as twenty pounds being furnished from a single tree. It would appear that sugar orchards improve if not tapped every year; my friend, Mr. H. J. Thompson, tells me that a *rest* does the trees good, and consequently they yield a larger quantity than if tapped every year.

Almost every farmer has his own method of preparing the sugar, but those who prepare it on a large scale, do so in a very scientific manner, with great care, and produce a better sugar. The sugar may be obtained in two forms from the sap, one in the form of a solid cake or lump sugar, the other in that of a soft, granulated or Muscovado grain.

The sap (being previously strained through a cloth), is poured into iron pots or kettles,† varying in dimensions according to the size of the sugar bush, but, more generally containing from twelve to fifteen or twenty gallons. The boiling is rapidly performed until the sap is of the consistence of syrup, with the addition of a little butter, to prevent it from boiling over, when it is moderated, and gradually discontinued until resembling thin treacle or molasses, being carefully skimmed as the scum forms on the surface. A slow fire is now used to bring it into a state fit for making the cakes of sugar, and this is known by pouring a few drops in a little snow or ice, and, if possessing the least gritty taste, it is immediately run into moulds, forming the cake sugar as generally seen in commerce.

If it is desired to obtain it in the form of soft or granulated sugar, the boiling is continued a very short time longer, until it is a trifling degree more gritty to the taste than the last, when it is removed from the fire, and is then constantly stirred with a wooden ladle or flat stick until it becomes quite cold, when it is obtained in the form of soft or crushed sugar. The more it is stirred the whiter, drier, and clearer in colour it becomes; this is produced by the evaporation of the remaining water, which goes on rapidly, and which prevents the cohesion of the particles which is so strong in the cake sugar. After it is thus prepared, it is placed in barrels or tubs, laid upon parallel sticks, with one or more holes bored at the bottom to permit the flowing out of the refuse syrup, very like honey in colour and consistence, and which still further produces a dry sugar, being similar in this respect to Muscovado. Some manufacturers use various substances to clarify and render the sugar whiter, such as slaked lime, a few eggs, and some milk.§ In this way the sugar is obtained almost perfectly colourless, and in the form of minute crystals or grains, perfectly clear and transparent, and free from any impurities whatever. From this form of granulated maple sugar, a superior kind of loaf sugar has been manufactured in the States, not in any way inferior to the loaf sugar of Europe.

To test the superiority of maple over cane and Muscovado sugar, I instituted the following experiment:—

Some *brown Muscovado sugar* was placed at the bottom of a wine-glass, which was then filled with water, and allowed to stand twenty-four hours without disturbance; a scum formed on the surface.

Some *maple sugar* a year old was pounded and treated in the same way; no scum formed on the surface.

The fluid and scum of the *Muscovado* were examined under the microscope, when large numbers of dead *acari* or *sugar insects* were found, many fragments of their bodies, numerous ova and young *acari*, and sporules of the sugar fungus in vast abundance; a few fragments of the sugar cane were present, showing the cells of the parenchyma, and a very few of the woody fibres.

The fluid of the *maple sugar* was examined, and *nothing whatever* was discovered worthy of observation.

This experiment is worth a host of arguments in favour of the superiority of the maple sugar over the other. All the *brown Muscovado* sugars contain this noxious insect, but the colourless *Muscovados* are quite free from it. If granulated maple sugar can be obtained cheaper, or even at the same price as Muscovado, and possessing a purity not to be reached by the other, is it not to be preferred? I shall not make any remarks upon the natural history of the insect, but would recommend those who may be curious in this matter to examine for themselves, or, I shall be happy at any time to repeat this experiment in their presence.

† Copper vessels are sometimes used, and also vessels lined with earthenware, which are superior to those of pure metal.

§ The Indians are said to clarify their sugar, in some instances, with the manure of dogs, which contains much phosphate of lime.

Independently of the presence of the sugar insect, maple sugar is not in any way inferior to cane sugar, but is infinitely superior in many respects. It is prepared at a time of the year when neither insects nor the pollen of plants exist to vitiate it, as is the case with common cane sugar. Its taste is superior to that of cane sugar, it possesses a delicious flavour when well made, and it sweetens equally as well. It can be eaten in a pure state for a considerable time without any unpleasant consequence, which is the reverse with cane sugar, undoubtedly one of the sources of worms in the body. As it is free from moisture, it may be preserved for years, and if exposed to the air becomes dry; it is this moisture in the Muscovado or cane sugar, which permits of the generation of the sugar insect, and which is prevented in the other from this opposite effect.

The subject of the manufacture of maple sugar is one of such growing importance to the commerce of this country, that I shall resume its consideration at a future opportunity.—*British American Journal of Medical Science*, July, 1851.

Craig Street, Montreal.

ON THE CAUSE WHICH MAINTAINS BODIES IN THE SPHEROIDAL STATE, BEYOND THE SPHERE OF PHYSICO-CHEMICAL AFFINITY.

BY M. BOUTIGNY.

M. BOUTIGNY referred to his former communications and well-known experiments on the peculiar state induced in liquids when in contact with very hot metals, and regretted he had not the means for exhibiting the experiments, as they required apparatus he had not at command in the Section, such as for the application of the spheroidal state of water to the purposes of the steam-engine. He referred to the experiments first shown at Cambridge and their extension since to explain some of the effects of ancient oracles. Alluding to the disputed points in the explanation of his experiments as to the repulsion of metals and fluids, and whether the effects were really entirely or not to be attributed to the properties of the thin stratum of vapour, Prof. Boutigny proceeded to show by experiment that when platina wire was coiled up in the form of a flat spiral and made hot and ether or alcohol fluid placed on it, in the spheroidal state the liquid would not pass through between the spaces, while the vapour readily did so.

A conversation ensued on the subject of M. Boutigny's showing the capability of the human hand to pass through red-hot molten metal without injury; and by the prompt kindness of Messrs. Ransomes and May the experiment was arranged to take place at seven o'clock in the evening. Accordingly, at that hour the members of the Chemical Section had the opportunity of seeing M. Boutigny pass his hand through the stream of liquid red-hot iron as it passed from the furnace, and afterwards scooping out portions of iron from the casting ladle, until the fluid sunk to the mere red-hot fluid state, when danger might be apprehended from the falling of the temperature causing the iron to adhere.—*Report of British Association in the Athenæum*

ON THE MICROSCOPIC CHARACTERS OF THE SEEDS OF LOBELIA INFLATA.

EXAMINATION IN CASES OF POISONING.

BY MR. FREDERICK CURTIS.

THE seeds of *Lobelia inflata* may be found in the pods of the dried plant as imported, or in the powder, as most of the seeds escape injury by the mill or mortar. Many fatal cases of poisoning have taken place in this neighbourhood from the very frequent administration of powdered Lobelia, and of the seeds, in doses of a tea-spoonful or more, by the disciples of Dr. Coffin.

By sifting the powder through apertures of $\frac{1}{16}$ inch diameter, I remove the coarser portion, and $\frac{1}{16}$ inch apertures are required to remove the finer particles. By this means a large bulk of the drug is dispensed with, leaving all the uninjured seed on the $\frac{1}{16}$ inch sieve.

This powder may be examined under a microscope of about eight diameters power. The seeds are readily distinguished: they measure about $\frac{1}{16}$ inch in length, and $\frac{1}{16}$ inch in breadth; they are puce-coloured, almond-shaped, and are beautifully and

regularly marked with ridges and furrows, and similar cross-ridges generally passing at right angles with the former, so that the integument has a series of oblong-square open cells over its entire surface, and presents an appearance resembling basket-work.

The seeds may be picked out individually, if required, with the point of a needle, either by transfixing them, or by wetting the needle.

To estimate the number of seeds in a given weight of the drug, I used the following method :—Weigh a drachm of the dried plant, pick out carefully all the stalks, and perhaps a very few leaves, so as to leave exactly one scruple of the membranous parts, powder this gently in a mortar, then weigh out one grain and divide into three parts ; each of which will represent one grain of the entire plant in reference to the number of seeds it would contain. This may be placed in separate portions under the microscope, and the seeds counted or picked out separately. The sieves save a good deal of labour. By proceeding in this way, I have counted thirty seeds to the grain of the dried drug.

I could not succeed in separating the seed by mixing the powdered drug with water, and straining.

In searching for the seeds in the contents of the alimentary canal, additional difficulties would obviously present themselves, such as the presence of fatty substances, &c. After drying, the fatty matters might be removed by chemical means, or by bibulous paper, and the residue carefully reduced to powder.

I have examined minute seeds from many plants, but have found none that are not included in the order which could be mistaken for *L. inflata*. Among these are the following varieties of tobacco :—broad-leaved Virginian, new scarlet, pink and Brazilian, foxglove and the harebell, which last resembles *L. inflata* in shape ; but its larger size, and its difference in colour and structure are very evident.

I have also made particular examination of the seed of as many varieties of lobelia as I could procure, namely,—*L. heterophylla*, *L. gracilis*, *L. gracilis alba*, *L. ramosa*, *L. syphilitica*, *L. erinus alba*, *L. propinqua*, *L. bicolor*, *L. triquetra*, and *L. cardinalis*, none of which resemble *L. inflata* except the last, which is larger, has a far rougher and coarser appearance, the cells being less distinct ; it has also a lighter colour. The resemblance is, however, so striking, that some care is required in distinguishing them.

P.S.—A few seeds of any other varieties of the order lobelia would be thankfully accepted from any of your correspondents, those above named having been obtained with some difficulty from different sources.—*London Med. Gazette*.

Maryport, July, 1851.

ON THE POISONOUS PLANTS OF GREECE.

BY DR. X. LANDERER.

LANDERER has enumerated the various kinds of corn, fodder plants, and poisonous plants which grow in Greece and Macedonia. Of these we quote the latter only, as being of Pharmaceutical interest.

RANUNCULACEÆ.—*Helleborus orientalis*; *H. niger* Tournefortii. *Adonis æstivalis*. *Ranunculus Lingua*, among rushes ; *R. aquatilis* ; *R. muricatus* ; *R. arvensis* ; *R. Philonotis*, all in damp places. *Ficaria vernalis*, in shady places near olive-groves. *Clematis flammula* ; *C. Vitalba*. *Anemone coronaria* ; *A. Stellata* ; *A. apennina*. These anemones, so-called, ἀνὰ τοῦ ἀνέμου, herba venti quod flos tantum vente flante aperitur, flower in February. *Thalictrum aquilegifolium* et *pubescens*, belong to the most rare mountain plants of Greece. *Nigella Damascena*. *Pæonia corallina*. *Delphinium Staphisagria*.

PAPAVERACEÆ.—*Papaver somniferum*, cultivated in the plain of Argos ; *P. Rhoeas*, very common among corn.

VIOLACEÆ.—*Viola gracilis*, on high mountains, near the Taygetus ; *V. Demetria*, on all mountains.

MELIACEÆ.—*Melia Azedarach* is the commonest zedrach of Greece.

RUTACEÆ.—*Ruta graveolens*, cultivated. *R. divaricata*, very common on all mountains. *Peganum Harmala*.

TEREBINTHACEÆ.—*Rhus Cotinus*.

RHAMNACEÆ.—*R. oleoides* ; *R. catharticus* ; *R. Alaternus* ; *Ilex Aquifolium*.

LEGUMINOSÆ.—*Colutea arborescens*, everywhere on mountains, chiefly in the Peloponnesus. *Spartium junceum*, very frequent near mountain-brooks. *Anagyris fatida*, near the harbour of Nauplia, in the islands. *Ornithopus scorpioides*, every-

where among corn. *Ervum Ervula*. *Galega officinalis*, in pools near the Orchomenos, Thermopyle.

ROSACEÆ.—*Amygdalus amara*.

CUCURBITACEÆ.—*Ecbalium Eluterium*. *Cucurbita lagenaria*. *Bryonia dioica*.

CRASSULACEÆ.—*Sedum acre*; *S. rufoescens*.

UMBELLIFERÆ.—*Oenanthe pimpinelloides*; *O. incrassans*. *Conium maculatum*, on rubbish, on the roads about Athens, in Chalkia, Karitena. *Chaerophyllum temulentum*, rare in the Peloponnesus. *Thapsia garganica*, very common about Athens. *Sium angustifolium*, everywhere near water-pools.

CAPRIFOLIACEÆ.—*Sambucus Ebulus*; *S. racemosa*; *Lonicera caprifolium*; *Hedera Helix*.

CICHORACEÆ.—*Lactuca Scariola*, in ditches near vineyards.

APOCYNÆÆ.—*Cynanchum erectum*; *C. acutum*; *Nerium Oleander*, everywhere near mountain-brooks.

CONVOLVULACEÆ.—*C. Soldanella*; *C. Sepium*; *C. arvensis*.

SOLANÆÆ.—*Solanum nigrum*, on rubbish; *S. Dulcamara*, near the pools of the mills at the lake of Lernai; *S. Lycopersicum*, cultivated; *Hyoscyamus niger*, very rare, on Spezzia and on the Taygetus; *H. albus*, frequent everywhere, on rubbish and brick-walls. *Atropa Mandragora*, *A. verna*, frequent near the olive-grove of Athens, and in the fields on the road to Eleusis; blooms in October. *Datura Stramonium*, in hollows near vineyards, and on the edges of wet corn-fields; near old conduits about Nauplia and Athens. *Nicotiana Tabacum*, cultivated everywhere. *Physalis Alkekengi*, very scarce on the Taygetus; *Ph. somnifera*, frequent in Kalamata on brick-walls. *Capsicum annuum*, cultivated in gardens.

SCROPHULARINÆÆ.—*Digitalis lavigata*, *D. ferruginea*, on the Parnassus. *Scrophularia aquatica*.

PRIMULACEÆ.—*Anagallis arvensis*; *A. coerulea*, everywhere among the corn. *Cyclamen hederifolium*, everywhere on hills and mountains; *C. neapolitanum*.

PLUMBAGINÆÆ.—*P. europœa*.

CHENOPODIACEÆ.—*Phytolacca decandra*. *Chenopodium viride*.

POLYGONACEÆ.—*P. aviculare*; *P. maritimum*.

THYMELACEÆ.—*Daphne Gnidium*; *D. buxifolia*. *Passerina Tartonraira*; *P. hirsuta*.

ARISTOLOCHIÆÆ.—*Aristolochia parviflora*.

EUPHORBIAEÆ.—*Euphorbia Peplus*; *E. helioscopia*; *E. platyhyllus*; *E. Characias*; *E. Apios*; *E. Parahias*; *E. spinosa*; *E. dendroides*. *Croton tinctorium*. *Ricinus communis*. *Mercurialis annua*.

URTICÆÆ.—*Cannabis sativa*. *Urtica pilulifera*; *U. urens*; *U. dioica*.

CONIFERÆ.—*Juniperus Sabina*. *Taxus baccata*.

IRIDÆÆ.—*Gladiolus segetum*. *Iris tuberosa*; *I. Pseudacorus*; *I. florentina*. *Crocus sativus*.

AMARYLLIDACEÆ.—*Narcissus poeticus*; *N. Tacetta*; *N. serotinus*.

LILIACEÆ.—*Scilla maritima*; *S. autumnalis*. *Anthericum græcum*. *Asphodelus fistulosus*; *A. ramosus*. *Allium sativum*.

ASPARAGACEÆ.—*Tamus communis*.

COLCHICACEÆ.—*Colchicum montanum*; *C. Bivona*.

ALISMACEÆ.—*Alisma Plantago*.

AROIDACEÆ.—*Arum Dracunculus*; *A. Arisarum*; *A. maculatum*.

GRAMINÆÆ.—*Lolium temulentum*, the Ina of the ancients, among corn and on the roads.—*Central Blatt*, No. xx., 1851, p. 318.

ON THE ESTIMATION OF THE STRENGTH OF MEDICINAL HYDROCYANIC ACID, OF BITTER ALMOND WATER, AND OF CHERRY-LAUREL WATER.

BY J. LIEBIG

LIQUIDS, which contain prussic acid, and are mixed with caustic potash ley until they have a strong alkaline re-action, yield, on the gradual addition of a diluted solution of nitrate of silver, a precipitate, which, on being shaken, disappears to a certain extent. Alkaline liquids, containing prussic acid, may also be mixed with a few drops of a solution of common salt, without the production of any permanent precipitate, until at last, on an increased addition, chloride of silver falls down.

This phenomenon depends on the fact that oxide of silver and chloride of silver are soluble in the generated cyanide of potassium, until there is formed a double

salt, composed of equal equivalents of cyanide of potassium and cyanide of silver, which is not decomposed by an excess of alkali. Liebig's method of estimating the prussic acid consists in determining the quantity of silver which must be added to an alkaline liquid, containing prussic acid, until a precipitate appears. Each equivalent of silver corresponds to two equivalents of prussic acid. Having caused several experiments to be made, which prove the efficacy of this method; and having carefully observed that the presence of formic acid and muriatic acid in the prussic acid, does not interfere with the correctness of this method, the author gives the following directions for examining officinal liquids containing prussic acid. The *aqua amygdalarum amararum*, being turbid, must be clarified by the addition of a known quantity of water: 63 grs. of fused nitrate of silver are dissolved in 5937 grs. of water. 300 grs. of this liquid correspond to one gr. of anhydrous prussic acid. Before applying the test, the vessel with the solution of silver is to be weighed, and of the latter so much is added to a weighed quantity (e. g. 60 grs.) of prussic acid, mixed with a small portion of potash ley and a few drops of a solution of common salt, and diluted with three to four times its volume of water, constantly shaking it in a common white medicine glass, until a perceptible turbidness takes place, and does not disappear on shaking. The solution of silver is now to be again weighed; and supposing 360 grs. are found to have been employed for the test, the 60 grs. of the tested prussic acid contain 1.20 grs. anhydrous prussic acid, or 100 grs. contain two grs.

Agua laurocerasi, which the author examined contained in one litre, one decigram. and the same quantity of *aqua amygdal. amar.* 7.5 decigramme of anhydrous prussic acid.—*Ann. de Chem. u. Pharm.* Bd. lxxvii.

MODE OF DISTINGUISHING ARTIFICIAL FROM NATURAL CAMPHOR.

BY MR. J. W. BAILEY.

By the application of polarized light, the smallest portion of natural camphor may be distinguished from the artificial camphor (hydrochlorate of camphene). If small fragments of each be placed separately on glass slides, and a drop of alcohol added to each, they dissolve and speedily recrystallize. If the crystallization of the natural camphor is watched, by means of the microscope and polarized light, a most beautiful display of coloured crystals is seen, while with the artificial product, nothing of the kind is witnessed.—*Silliman's Journal*, May, 1851.

ON THE QUANTITATIVE ESTIMATION OF MANGANESE.

BY RICHARD LAMING, ESQ.

I FIND, contrary to what is stated in works on chemical analysis, that carbonate of manganese is not decomposable at ordinary temperatures by the oxygen of the atmosphere, but remains permanently white if it have been precipitated without an excess of carbonate of potash or carbonate of soda. When an excess of either of these reagents is used in its precipitation, the excess of the alkali decomposes a portion of the metallic carbonate, and becomes a sesqui or a bicarbonate. If a bicarbonate of the alkali be used to precipitate carbonate of manganese, the precipitant may be added in excess, and the precipitate exposed to the air with impunity. Manganese resembles the magnesian class of metals in its carbonate being undecomposable by caustic ammonia; hence either of the carbonates of the volatile alkali may be used with effect to precipitate a carbonate of manganese that will remain persistent in the atmosphere. Carbonate of manganese, when exposed to any high temperature approaching near to redness, passes at once into the black oxide, without apparently going through any intermediate state of oxidation.—*Phil. Mag.*, June, 1851.

ON THE DETECTION OF SULPHUR.

BY MR. J. W. BAILEY.

DR. PLAYFAIR's beautiful salt, the nitroprusside of soda, is justly recommended by its discoverer as the most delicate of all tests for alkaline sulphides [sulphurets].* An application of it, which is very obvious, although not alluded to by Dr. Playfair, is to employ it not only as a direct test for alkaline sulphurets, but as an indirect one

* See *London, Edinburgh, and Dublin Phil. Mag.*, vol. xxxvi., p. 208.

for sulphur in any of its compounds. Any substance containing sulphur will yield an alkaline sulphuret if heated with carbonate of soda, either with or without the addition of carbonaceous matter, according as a deoxidizing action is or is not required. The magnificent purple which is then produced by the addition of the fused mass to a drop of the solution of the nitroprusside will at once prove the presence of sulphur. This reaction is so easily obtained, and is so decisive, that the nitroprusside of soda must take its place among the most useful adjuncts to the blowpipe tests. By means of it, the presence of sulphur in the smallest particles of coagulated albumen, horn, nails, feathers, mustard seed, &c., which can be conveniently supported on a platinum wire for blowpipe experiment, may be most distinctly shown; and I have repeatedly obtained the characteristic purple tint in operating upon a piece of a single fibre of the human hair *less than an inch in length*.—Silliman's *Journal*, May, 1851.

ON BITTER ALMOND WATER.

BY M. GRUNER.

BITTER almond water of constant composition may be obtained artificially by mixing 110 grs. of pure *ol. amygdal. amar.*, deprived of prussic acid, with two ounces of prussic acid of the Prussian Pharmacopœia, two ounces of highly rectified spirit of wine, and 20 ounces of water.—*Central Blatt*, No. 23, 1851, p. 368.

ON THE PREPARATION OF MORPHIA.

BY M. RÖDER, APOTHECARY OF LENZBURG.

THE aqueous extract of opium is concentrated by evaporation, and mixed with chloride of tin, till no further precipitate appears. The liquid is then allowed to settle, is poured off, the precipitate washed, and the washings mixed with the poured off liquid. To this mixture is then added ammonia, and the precipitate which it produces is to be digested with ether, in order to remove the narcotine, and then with alcohol, as long as the latter acquires a bitter taste. The alcohol being then partially removed by distillation, the pure morphia is obtained in the form of crystals.—*Central Blatt*, No. 23, 1851, p. 368.

ON DRUG GRINDING.

BY MR. CHARLES V. HAGNER, OF PHILADELPHIA.

THE twenty-first volume, No. 1, January, 1849, of the *American Journal of Pharmacy*, contains an interesting article on the subject of Drug Grinding, by Mr. Redwood. It is of peculiar interest to me, and in conversing with different Druggists on the subject, I have been repeatedly asked to make known some of the results of my experience in that line, and to furnish some views and observations on the article referred to. My experience has at least been of some duration; I have been powdering drugs for this city, man and boy, thirty-nine years, having commenced it in 1812-13. My competitors of that day were John Price, a perfectly dependable and honest man in his business, and an individual named Jack West. They operated with rude horse-power mills, and quite primitive apparatus. They will be remembered by all the old Druggists and Apothecaries of this city, who will also doubtless remember, that not long after I commenced the business, I succeeded in raising the standard of powders (in point of fineness) equal if not superior to any in this country or in Europe, which standard I was subsequently *forced* to reduce by circumstances which I will state hereafter.

One of my earliest attempts at grinding drugs was on a lot of cream of tartar, some 6000 lbs., for Dr. Haral, an extensive druggist of that day. He showed me the article ground, which was about the fineness of tolerable coarse common table salt, the custom then being to pound it in mortars. He asked me if I could grind it; I told him I thought I could, much finer than the sample, and at a lower rate than he had previously paid (three cents per lb.). I procured teams, and hauled it to the Falls of Schuylkill, where I resided, and where my father had some mills. Being anxious to try the experiment, I commenced grinding it forthwith, about sun-down, on a four feet pair of mill-stones. Finding it to grind easily and rapidly, I continued at it until it was finished, about the middle of the night. By nine o'clock next morning, I had it on the doctor's pavement, much to his surprise and astonishment, and still more so, when he examined the article and the style of the powder, which was altogether different from anything he had ever before seen. He seemed to think

there was some enchantment or magic about it, and would not believe, until he tested it in various ways, that it was his cream of tartar. After some time, however, he became perfectly convinced of the fact, and paid me liberally for the job. This affair soon became known to the other Druggists, and I had, I believe, all their cream of tartar to grind for some six or eight years, when my method of grinding it became known to others, and only within two or three years past adopted in London. From Mr. Redwood's drafts and description of the drug-mills in London, and from what I have heard from other sources, they seem to be unacquainted with the use of mill-stones in drug-grinding.

My success in this affair led me into the business of powdering drugs generally, and I have been at it ever since. I could, I suppose, enumerate some twenty-five or thirty competitors I have had at different times, who have been tempted to go into the business from false and erroneous views of the profits arising from it, which they very soon discover are all fallacious; and they also become acquainted with the fact, that if they are honest in their business—not dealing in drugs—confining themselves entirely to a commission business, that is, powdering for others, as I have, as a matter of caution and principle always done, they will, from the limited extent of the business, make little or nothing of it; and if, on the contrary, they are dishonest and fraudulent, they are sooner or later discovered, and they lose their character and their business. I have in my time seen failures from both these causes.

There is, perhaps, no other business in which there are greater opportunities, more temptations to dishonesty and fraud, and more thanklessness—I may say *punishment*—for being honest, than in this business of powdering drugs. You have not only the temptations and fault-finding on one side to resist, but you have the punishment on the other side. Often have I been censured, and frequently made to pay for losses in powdering drugs, which were altogether unavoidable and from no fault of mine, but from the nature and *state* of the article sent to me, which might have been avoided by adopting the plan I have every reason to believe is sometimes pursued elsewhere, of putting some foreign substance in the article to make up a portion of the loss in powdering.

It is perfect nonsense to expect a uniform loss in powdering any particular drug, with but few exceptions; cream of tartar, for instance, is one from which there seems to be no evaporation in the process of grinding; on the contrary, I have sometimes thought there was an absorption from the atmosphere sufficient in some cases to increase the weight. In this article I rarely lose more than from half to three-quarters of one per cent., and most of that arises from extraneous substances—nails, chips, and other things we discover in it and throw out. Mr. Redwood states that the loss in powdering this article in London, is two per cent.; from the slow and bungling manner in which they grind it there, I only wonder it is not more.

We sometimes receive vegetable substances, roots, barks, gums, &c., direct from the hold of a ship, or from damp cellars; at other times we receive the same articles from the garret of a store, where they may have been for a year or more. It is ridiculous to expect the same loss in both cases. Most of the articles we powder contain more or less water, which we are obliged to dry out, and if we did not dry them artificially, when we reduced them to such minute particles as constitute a fine powder, the water would in a great measure escape by evaporation. This constitutes the loss in powdering drugs, at least the great amount of it. Some time back, I received a large lot of bayberry bark from a house in this city, who had bought it without sufficient examination, for it had been completely saturated with water, purposely, I suppose, by some "financier" to increase the weight. When I opened it, and saw the condition it was in, I called the attention of the owner to it, but he had unfortunately already paid for it. I dried it, and it lost over thirty-five per cent. in the drying alone. Now what a position would I have been in, had I been restricted to a loss of two or three per cent. It would have taken a considerable quantity of what Mr. Redwood facetiously calls "veritable powder of post" (saw-dust) to have made this matter straight.

Twenty years back I attempted to unite to my other operations that of chipping and grinding dye woods, and ground in all from fifteen to twenty tons for different parties; and although the wood appeared to be dry, it lost over two hundred pounds on each ton, caused by evaporation on being cut into fine chips across the grain of the wood. Of course I received the usual amount of "rowing up" for making such losses; so much so that I became heartily sick of the business, and sold out, at half the cost, the apparatus I had erected.

It is customary to remedy this difficulty, not with "powder of post," but "*aqua*

font." Under the pretence that it improves the quality, water is freely used, not only to make good the loss, but a little further, and the consumer is made to pay a pretty high price for water. I have seen barrels of chipped wood that have laid some time in a store, fall short from fifteen to twenty pounds of the marked weight. I think it is a fraudulent and useless custom. If the article is really improved by the operation (which I very much doubt), there is plenty of water in every dye-house; let the consumer water it as much as he chooses—let the dealer sell him wood, not water, and charge accordingly, and let the chipper be a "hewer of wood;" but have some compassion on him, and do not also make him a "drawer of water."

The important article of opium comes to us in very different conditions. I believe it is the general custom of the Druggists to keep this article in their cellars to prevent its drying and losing weight; some, however, do not, particularly when it is intended to be powdered; of course the loss in the former must necessarily be greater than in the latter instance, and it would be perfectly unreasonable, under such circumstances, to bind the powderer to a regular per centage of loss in powdering opium. I have been informed, and I believe correctly, that there exists in some other places a conventional rule of six per cent. in powdering opium; so far as I remember, I rarely, if ever, powder it at a less loss than eight per cent., and sometimes as great as twenty per cent. I have examined my books in reference to the last twelve lots of opium powdered, and find they amount to 165 lbs. 12 ozs. received, and 142 lbs. 2 oz. returned; the least loss eight per cent., and the greatest near twenty per cent., the average being 14 lbs. 5 ozs. per cent. Mr. Redwood gives the average loss in powdering this article in London at 14 lbs. 14 ozs. on the 112 lbs., the greatest eighteen and the least six per cent.

It would be a very easy matter for any Druggist to ascertain the loss in drying any particular lot of opium, by cutting a portion into very small pieces, and drying it sufficiently to make a *fine* powder. Yet, notwithstanding this simple method of ascertaining the fact, I have met with instances (not many, to be sure, and none lately), where persons have sent their opium elsewhere to be powdered, for no other reason than that of the loss being less than I made. Perhaps I might have satisfied them had I made use of the "powder of post," or something else, which is and must be done by every one who powders ordinary opium at a loss of only six per cent. This, however, I never have done, and never will do. I do not profess more honesty than my neighbours; but if I had no scruples on the subject, I can imagine a case where I might make myself amenable to justice as a participant in causing the death of a fellow-being, whose life might be lost for the want of a proper article being administered. I repeat, if there were no other motives, I would not, under any circumstances, make myself liable to such a charge. Opium is one of the most important of the drugs that pass through my hands. Every Physician, Druggist, and Apothecary, knows the importance of having it right, and, so far as it depends on me, it shall be right, be the loss in powdering what it may.

With a conventional loss of six per cent. there can be no uniformity in the article. A powderer receives a lot of opium so dry that it only loses six per cent. in powdering. He receives another lot that loses twenty per cent. To bring the loss on the latter to the same as the former, he must put in fourteen per cent. of adulteration, and then you have one article fourteen per cent. less in efficiency than the other. From some cause unknown to me, the consumption of powdered opium has greatly increased in the last five years, and seems to be increasing annually, if I may judge from the quantities I powder.

From what has been said above, it must not by any means be inferred that I have ever been asked by any Druggists to adulterate their opium; this has never been the case. The only effect has been very frequent and severe scoldings about the loss; but I have got used to these, and always look for them as a matter of course. Indeed, I have long been satisfied that there are very wrong impressions prevailing on the subject of adulteration of drugs in this city, at least as it regards those kinds that pass through my hands. I have no interest in this matter; my business is to powder all articles sent to me, good, bad, or indifferent. I neither buy nor sell drugs—know little or nothing about their cost or value, and whether they be adulterated or not is of no pecuniary interest to me. I am, therefore, perfectly disinterested, and, under these circumstances, assert positively, that for many years past I have not been asked by any Druggists to adulterate any of their drugs. I often receive articles to powder that I think are not very good, and often receive mixtures of the same article to powder together. For instance, a Druggist may have rhubarb of a dark colour, and send me some of a lighter colour to be mixed and powdered with it.

Again, I sometimes receive two or three different kinds of bark to be powdered together—these things are of frequent occurrence—but as to adulterating drugs with a foreign substance, never. I know that there is a considerable amount of suspicion prevailing among certain Druggists on this subject. A suspects B, and B suspects A, but as far as my experience goes, I have no hesitation in saying they are all mistaken. Of course I do not know what is done in other establishments; I only allude to my own operations. Some years ago a powdering establishment was in operation here, and failed from one of the causes I alluded to before, which it is easy to comprehend, when I mention that on its being broken up, one of the hands came to me for employment; of course he could do every thing—powder this, powder that, and grind t'other—never had any difficulty except in one thing, and that was “grinding cream tartar.” I expressed my astonishment at this, knowing it to be the easiest thing in the whole catalogue of drugs to powder; and on asking him what the difficulty was, he replied, quite innocently, “The alum always stuck the stones fast.” Here was the secret; it seems it was the custom of the concern to grind alum with their cream tartar, and I saw in a moment the whole cause of this man's trouble and difficulty. Now I have not the slightest idea that this was ever done by the order or with the knowledge of any respectable Druggist of this city. I have frequently heard (and I believe it is notorious) of this being extensively practised elsewhere, but this is the only instance that I ever knew or heard of its being done in this city.

It has frequently struck me as something singular, that in the manufacture of blue mass, I have never, in any instance, been asked or required by any one to make it of less proportion than one-third mercury. I have seen published at different times, here and in New York, analyses of different manufacturers' make, foreign and domestic, greatly falling short of their due proportion of mercury; yet, strange to say, I have been making it for years past—have made tons of it—the druggists send me all the materials to make it of, and in no single instance has it ever come to me in any other proportion than one-third of mercury. Here again, I have no interest in this matter. It is of no consequence to me, pecuniarily, whether it comes in the proportion of one-third, one-fourth, or one-fifth mercury. I do not deal in the article, and I merely mention this in proof of what I have before stated as to the general correctness of the Druggists of this city. Blue mass of my manufacture is in many hands—scattered in every direction—it is no great difficulty to make an analysis of it, and I fearlessly challenge investigation in proof of what I have stated above.

In speaking of the adulteration of drugs, I do not include those that come under the head of “spices.” In these, here and everywhere, there is the most vile and abominable system of adulteration prevailing—not with Druggists, however. I grind spices for many of them, and am never required to adulterate them, except in one article—ginger. To satisfy some of their customers, they are sometimes obliged to furnish a common and cheaper article of ginger. On these occasions, and they are rare, I grind a portion of corn with it, but it is done openly, always, I believe, with the knowledge of the purchaser, and sold as a common or adulterated article. This is the only exception in spices or anything else that I am required to adulterate. With but two exceptions, I do not grind for the grocers; they can get their spices ground *cheaper* than I can grind them. Some of the “spice-grinders,” for instance, will grind a single bag of pepper for nearly what it costs me to send for and return it, and I believe, make well out at that; perhaps some of them would even pay for the *privilege* of grinding it, if it were not for appearances. They understand all about “powder of post,” and the good natured public are made to swallow a great many things they little dream of. Let us accompany one of our worthy epicurean citizens to his dinner, and see what he dines on. He has a good beef-steak before him, and puts in his plate a yellow substance composed of mustard, turmeric, meal, and cayenne pepper. He likes cayenne, and sprinkles over his steak ground dye woods, cake meal, pepper, Venetian red, Spanish brown and the like. Perhaps he takes a fancy also to black pepper; here no one can tell what he gets—anything is good enough to make black pepper, the sweepings of the mill, old damaged rice full of insects, cake meal (that is flax seed after the oil is expressed from it), mustard brand, &c. &c. Then comes the dessert—pies, custards, &c., flavoured with cloves, cinnamon, allspice, mace, nutmegs, with all their *accompaniments*, too “numerous to mention,” and finishes his dinner with some beautifully coloured strawberry ice cream, in which he sends after the rest a very pretty extract or solution of bugs (cochineal), a nauseous little insect, and our worthy friend arises from his table with the comfortable feeling of having made a very good dinner. It must, at least, be admitted, he has had a very considerable variety.

Mustard brand is a favourite article among spice *manufacturers* for adulterating black pepper. It is all very well if it is consumed before a certain time, but let it stand a few months, and then few persons will have the courage to put their noses in the pepper box. It contains a great quantity of oil, which soon becomes rancid; and as offensive as old rancid mustard is, when it is incorporated with pepper, it is ten times worse.

In regard to the qualities of drugs that pass through my hands, there was undoubtedly a very great change—I might, perhaps, say, revolution—on the institution of the College of Pharmacy of this city. I remember it well. I was in full operation at the time, and had good opportunities of seeing the effect produced; and ever since that time, the large bulk of the drugs I have to do with, are far superior to what they had previously been. The institution of the College of Pharmacy was about the same period of the introduction of quinine into general use. Previous to that time, I powdered immense quantities of Peruvian bark—1000 lbs. where I now do 50. The great bulk of it was a miserable spurious article, such as no respectable Druggist of this day would touch. I rarely see it now. Nearly all the bark I powder now is of the best qualities; and so with other articles—jalap and rhubarb for instance—both of which have greatly decreased in the quantity powdered, but improved in the quality.

Every experienced Druggist is aware of the fact that the sale of powdered drugs has greatly decreased in this city, in the last fifteen or twenty years. There are several reasons for this; the principal one, perhaps, is that extracts and other preparations have taken the place of powders, but I believe their sale has not decreased in the same proportion in other cities. There is a special reason for this, and that has been the superior fineness of their powders. I allude now to their fineness of division, not their purity. Twenty years back ours were superior to theirs, but as I stated before, I was *forced* to reduce the standard about fifteen years since, and I will now explain how it came about. For a period of about sixteen years I had pretty much a monopoly of the powdering for this city, and during all that time had a regular list of prices, precisely the same as they existed in New York, and from which I never deviated. My establishment was then, and is now, of sufficient capacity to powder in five months steady work, all the drugs that are required to be powdered in this city in a year, and, with the prices I then received I could successfully compete with any one, and produce powders equal to any other place in the world. There is no difficulty in reducing powders to any required degree of fineness; the only question with me is, will it pay? About fifteen years since I had some competitors, who in order to obtain business, reduced the prices, at the same time reducing in a much greater ratio the quality or standard of the powders. The Druggists insisted on my charging the same as they charged. I resisted as long as I could, but was finally obliged to give up, and the only thing I could do in self-defence was, at the same time to reduce my standard of fineness; and as it appeared to me the Druggists then cared more for cost than quality, all I could do was to accommodate them. It is comparatively an easy matter to reduce drugs to a certain degree of fineness, but to go beyond that is the trouble. The hard work and time employed increases in geometrical progression in proportion to their fineness. If one takes a hammer, for instance, and strikes a stone, he breaks it into two pieces—it will take two blows to break it into four—four blows to break it into eight pieces, and so on. The time and labour of reducing a substance to a million of particles is little compared to what is required to reduce that million to twenty millions of particles. It was entirely impossible for me to put this additional labour on an article and receive no more for it than my competitors, who could powder in their way 100 lbs. in the same time and with the same force and power that it took me to powder 10 lbs. This is the whole story, and accounts for the inferior fineness of our powders for some years past. I am now endeavouring to bring up the standard. The Druggists are becoming aware of the necessity of doing so, and it remains to be seen whether I shall succeed or not. I suppose the superiority of fine over coarse powders, in the practice of medicine is universally admitted, and that the same rule that applies to mercury in blue pill applies also to them; that is, the more minute the particles, the more surface they present for the action of the stomach.

I intended to have noticed in detail Mr. Redwood's article, and have much more to say on the subject; but I feel that I have already taken up too much space, and may, perhaps, some day resume the subject.—*American Journal of Pharmacy.*

ON THE DETECTION AND QUANTITATIVE DETERMINATION OF STEARIC ACID IN BEES' WAX.

BY A. OVERBECK.

No accurate method of determining the quantity of stearic acid in bees' wax has hitherto been pointed out. The means heretofore employed are either insufficient or impracticable; to the latter class may be referred those proposed by Lebel, in the *Journal de Chimie Méd.* Equally unsatisfactory is the test of mixing an alcoholic decoction of the suspected wax, deprived of its insoluble residue by decantation, with acetate of lead, or by directly boiling the wax with the acetate.

If the proportion of stearic acid be considerable, it is easily and safely discovered by boiling with alcohol and testing the solution with litmus; if, however, the proportion be but small, this test is not sufficiently delicate. Before proceeding to make direct experiments for the purpose of discovering a new method, applicable in all cases, the author found it advisable to make a few preliminary indirect experiments. A solution of carbonate of soda, one part (3ii) in fifty parts (12½) of distilled water was prepared and divided in two equal parts, each separately boiled, and to the one a small piece (fifteen grains) of stearic acid added, and to the other a small piece (9j) of pure bees' wax. In the first case an abundant froth immediately appeared with the simultaneous development of carbonic acid: not so in the latter case. After two minutes both vessels were removed from the fire and allowed to cool. The liquid containing the wax was of a mucilaginous nature, and assumed, at 40° C. the consistence of a cohesive glue; at 33° C. it congealed to a tremulous jelly, which consistence it also retained afterwards. The decoction with wax retained, from the beginning to the end, its original fluidity; the small particles of wax suspended in it united, when left standing, into a cake, which was removed from the surface, washed with water, pressed between blotting-paper and then weighed. It had lost nothing in weight, and its external appearance, its melting point and solubility in boiling alcohol had all remained unchanged. The liquid freed from the wax was left to crystallize, and thus the originally employed quantity of carbonate of soda was re-obtained.

The conclusion drawn from this experiment is that such a diluted solution of soda (1.50), which speedily saponifies the stearic acid, exercises absolutely no influence on bees' wax.

The gelatinous mass obtained by saponifying the stearic acid was further mixed with six ounces of alcohol of 0.82 sp. gr., which dissolved it at 25° C., and yielded a clear liquid.

A second experiment was made to determine the action of cold alcohol upon pure bees' wax. One drachm of the latter was left in contact, for twelve hours, with two ounces of alcohol of 0.82 sp. gr., and frequently shaken; the alcohol was then filtered and evaporated. Not a trace of a residue remained behind. The bees' wax was, therefore, insoluble in cold alcohol.

These results, with the facts already known, suggested to the author an accurate method of detecting the presence, and of determining the quantity, of stearic acid in bees' wax, in all cases even when the proportion of the stearic acid is only two per cent. An undetermined quantity of wax to be tested is boiled for one or two minutes with an excess of a solution of carbonate of soda (prepared with distilled water) of the above-mentioned strength (1.50). If stearic acid be present an abundant froth immediately appears with the simultaneous development of carbonic acid. According to the greater or less proportion of stearic acid the ley assumes on cooling, a mucous, lubricous or gelatinous consistence, or congeals throughout into a solid mass. One fiftieth part of stearic acid in the wax imparts to the ley a marked mucous condition. If the wax be pure, the ley retains, even when cold, its original fluidity.

To determine the quantity of stearic acid the author at first proceeded in the following manner:—The expelled carbonic acid was conducted into lime-water, and the proportion of stearic acid calculated from the precipitated carbonate of lime; considering, however, the circumstance that in case of an excess of carbonate of soda only *neutral* stearate of soda would be formed. The flask for boiling must be as capacious as possible, and the tube for conducting the gas moderately wide; and before assuming the curve into the horizontal direction it must also rise for some distance vertically, on account of the reaction taking place very suddenly, and the mixture producing an abundant froth.

Although this method offers no difficulty for experienced Chemists, it appeared still advisable to find a more simple one, which may be accessible for every tradesman. The wax having been boiled with the ley, as above stated, cold alcohol is added until the saponaceous jelly is dissolved, becomes quite clear and remains so even when cold. The wax is generally precipitated immediately in flakes, because the temperature of the liquid falls directly below 60° C. on the addition of the cold alcohol, or separates very soon, and it is then removed from the soap-spirit by filtration through coarse canvas with pressure, then washed with warm water in order to remove the excess of carbonate of soda which might have been simultaneously precipitated by the alcohol, pressed again, and weighed. The loss of weight indicates the proportion of stearic acid.—*Archiv. der Pharmacie*, April, 1851, p. 54.

ON THE ASHES OF CINCHONA BARKS.

BY A. PUTTFARCKEN.

THE various sorts of cinchona barks have often been made the subject of chemical examination, but no experiments exist to corroborate or to refute the hypothesis—that with the increase of the alkaloids in the barks, the proportion of lime diminishes. Although the present experiments* do not definitively settle the question, yet they speak much for the truth of it. The quantities employed for the analysis varied from one drachm to ten drachms; but as the examination of the ashes was abbreviated in order to determine a certain point, these small quantities were sufficient for the purpose. The greater number of barks were taken from the collection of the Chemico-Pharmaceutical Institution of Jena, and had been obtained in part from Michal and Apel, of Schweinfurt, and from Brückner, Lampe, and Co., of Leipzig, both in former years and more recently, and in part also from the collection of Von Bergen, through whose kindness they came into the possession of Dr. Wackenroder during the meeting of German Naturalists and Physicians in Hamburg.

All the specimens of bark had, moreover, been selected by Prof. Schleiden, and, as far as it was possible, correctly determined by him. Before incineration they were coarsely triturated and exposed for some time to the heat of a room-stove, so that they could be considered as perfectly dry. The incineration was performed in a platinum crucible placed in a Hessian crucible. It was effected slowly, and towards the end of the process a very slight heat only was used, so that only traces of caustic lime were generated. The ashes were uniformly weighed, after the covered crucible had been allowed to get cool for half an hour. They were dissolved in hydrochloric acid, and the lime precipitated by oxalic acid as oxalate of lime. After being well washed and dried, the latter was burnt, together with the filter, and then slightly heated to redness in the platinum capsule. The weight of the ashes of the filter was subtracted. The colour of the ashes was observed in order to indicate the large proportion of manganese in some barks, which were coloured of a beautiful green by the manganate of potash. The proportion of the alkaloids, added for the sake of comparison, is taken from the Monograph of V. Bergen, and from the *Encyclopädie der Naturalien und Rohwaarenkunde* of J. and E. Martiny (Quedlinburg and Leipzig, 1843). The synopsis of the proportions of ashes and of lime in the coarser, middling, and thin barks, corroborates the statements of Staffell with regard to the horse-chestnut and walnut-tree (*vide Archiv*. Bd. 64, p. 1 and 129), namely, that the younger organs of one and the same plant contain a larger proportion of inorganic substances, than the same organs do in a more advanced state of vegetation, supposing the same quantities (by weight) of the perfectly dried parts of the plant to be compared with one another.

* The present experiments have long been designed by us, as it appeared very probable that the proportion of alkaloids in cinchona barks stood in some relation to that of the ashes. The experiments, however, were deferred from the want of a standard by which to be guided in the investigation. But Mr. Staffell has lately made some experiments with two indigenous trees, which may aid in arriving at correct results in the examination of cinchona bark. The experiments of Mr. Puttfarcken were performed with the greatest care in our laboratory, and may be relied upon as correct.—*H. Wackenroder*.

FALSE CINCHONA BARKS.

Name of the Bark and source whence it was obtained.	Per-centage of Ashes in the Bark.	Per-centage of Carbonate of Lime in the Bark.	Per-centage of Caustic Lime in the Bark.	Per-centage of Carbonate of Lime in the Ashes.	Per-centage of Caustic Lime in the Ashes.	Colour of the Ashes.
1. <i>China caribaea</i> (from Professor Martius)	3.1	3	1.68	96	53.7	Dark green
2. <i>China caribaea</i> (Br. L. & Co.)	1.5	1.2	0.67	79	44.2	Greyish brown
3. <i>Ch. nova Brazil</i> , flat pieces (Br. L. & Co., 1846)	1.3	1.2	0.67	92	51.5	Grey
4. <i>China nova Brazil</i> , quills (Br. L. & Co., 1846)	2.3	1.8	1.01	78	41.7	Light grey
5. <i>Ch. nova Brazil</i> (uncertain whence obtained)	2.6	1.6	0.89	62	35.8	Black
6. <i>Ch. Tecamez</i> (Br. L. & Co. 1846).....	7.9	6.6	3.7	84	47	White
7. <i>Ch. nova Surin.</i> (uncertain whence obtained)	2.7	2	1.1	74	41.4	Reddish grey

Nos. 3-5. The ashes were coherent, probably in consequence of a large proportion of potash. The determination of the ashes, therefore, is less correct than that of the lime, as the former contained small fragments of carbon.

BARKS CONTAINING CINCHONINE.

8. <i>China rubiginosa</i> , thick broken quills and flat pieces <i>a</i> (Br. L. & Co.) ...	2.6	2.3	1.29	94	52.6	White
9. <i>Ch. rubig.</i> Michal et Apel, identical with Maracaibo (from Bergen).....	2.3	2.2	1.23	95	53.2	White
10. <i>Pseudo Lora</i> , thin quills (uncertain whence obtained)	3.3	2.1	1.18	64	35.8	Grey
11. <i>China Lora</i> , middling sized quills <i>b</i> (Br. L. & Co., 1846)	2.7	1.1	0.61	41	22.9	Dark green
12. <i>Ch. Lora</i> , middling sized quills with coating [<i>Kruste</i>] (Br. L. & Co., 1846)	1.6	1.3	0.73	87	48.7	Very green
13. <i>Ch. Lora</i> , middling sized quills (V. Bergen)	1	0.8	0.45	60	33.6	Greyish green
14. <i>Ch. Lora</i> , thick semi-cylindrical quills (V. Bergen)...	1.6	1.4	0.78	91	50.9	Greyish brown
15. <i>Ch. Ten Pallida</i> , with lichen, thin quills <i>c</i> (source unknown)	4.9	3.9	2.18	79	43.2	Greyish green
16. <i>Ch. Ten Pallida</i> (Br. L. & Co., 1846).....	2	1.4	0.78	69	38.6	Grey
17. <i>Ch. Huamalies</i> , flat pieces <i>d</i> (Br. L. & Co., 1846)	1.5	1.4	0.78	90	50.4	Grey
18. <i>Ch. Huamalies</i> , middling sized quills (Br. L. & Co., 1846).....	1.7	1.5	0.84	86	48.2	Grey
19. <i>Ch. Huamalies</i> , thin quills (Br. L. & Co., 1846)	1.8	1.2	0.67	67	37.5	Grey
20. <i>Ch. Huamalies</i> , very thin quills (V. Bergen)	1.9	1.8	1.01	96	53.8	Grey
21. <i>Ch. Huamalies</i> , middling sized quills (V. Bergen)...	1.9	1.3	0.73	66	36.9	Grey
22. <i>Ch. Huamalies</i> , larger broken quills (V. Bergen)	2.3	2.1	1.18	87	48.7	White
23. <i>Lima China</i> (source uncertain)	3.1	2.1	1.18	65	36.4	Grey
24. <i>Huanuco China</i> , thin quills <i>e</i> (V. Bergen).....	1.5	0.5	0.28	32	17.9	Dark green

Name of the Bark and source whence it was obtained.	Per-centage of Ashes in the Bark.	Per-centage of Carbonate of Lime in the Bark.	Per-centage of Caustic Lime in the Bark.	Per-centage of Carbonate of Lime in the Ashes.	Per-centage of Caustic Lime in the Ashes.	Colour of the Ashes.
25. <i>China Huanuco</i> (Br. L. & Co., 1846).....	1.3	0.5	0.28	38	21.3	Greyish green
26. <i>China Huanuco</i> , middling sized tubes (V. Bergen)...	1.8	0.7	0.39	37	20.7	Grey
27. <i>Ch. Huan. electa</i> (Br. L. & Co., 1838).....	1.9	0.7	0.39	35	19.6	Greyish green

BARKS CONTAINING QUININE.

28. <i>Ch. regia?</i> very thin quills f (Br. L. & Co.)	2.8	1.4	0.78	50	28	Green
29. <i>Ch. regia tecta</i> , middling sized quills (Br. L. & Co.) ..	0.7	0.5	0.28	71	39.8	Dirty green
30. <i>Ch. regia s. epiderm.</i> , the largest, broadest, flat piece, with little brown coating (Br. L. & Co.)	0.6	0.5	0.28	92	51.5	Greyish green
31. <i>Ch. regia s. epiderm.</i> (source unknown).....	0.6	0.5	0.28	92	51.5	Greyish green
32. <i>Ch. regia s. epiderm.</i> , very thin flat pieces (Br. L. & Co.) ..	0.4	0.3	0.17	75	42	Green

BARKS CONTAINING BOTH CINCHONINE AND QUININE.

33. <i>Ch. rubra</i> , flat pieces g (Br. L. & Co., 1846)	2.7	2.3	1.29	83	46.5	White
34. <i>Ch. flav. dura</i> , thinnest quills h (Br. L. & Co.) ...	3.1	2.9	1.62	94	52.6	Light Green
35. <i>China flav. dura</i> (V. Bergen)	1.3	1.2	0.67	92		
36. <i>Ch. flav. dura</i> , flat barks (Br. L. & Co.)	2.5	1.6	0.90	65	51.5 36.4	Grey White
37. <i>Ch. flav. dura</i> , middling sized quills (source uncertain).....	1.5	1.4	0.78	94	52.6	White
38. <i>Ch. flava fibrosa</i> , fragments and splinters of flat large pieces i (Michal & Apel)...	2.1	1.8	1.01	89	49.8	White
39. <i>Ch. flava fibrosa</i> , flat quills (Bergen)	1.8	1.7	0.95	92	51.5	White
40. <i>Ch. flava fibrosa</i> , very thin quills (Br. L. & Co.)	1.7	1.4	0.78	80	44.8	Grey
41. <i>Ch. flava fibrosa</i> , a flat piece with coating (Br. L. & Co.) ..	2.0	1.7	0.95	85	47.6	Grey

NOTES TO THE FOREGOING TABLES.

a No. 8 is perhaps only a rusty coloured *China flava fibrosa*. Schleiden.

b No. 11—14. The proportion of the alkaloids in the Loza is given differently. Göbel gives 0.47 per cent.; Michaelis 0.34 per cent.; Thiel 1.08 per cent.

c No. 15. The larger proportion of lime is caused by the lichens. No. 15, 16. According to Von Santen, the proportion of the alkaloid is 0.25 per cent.

d No. 17—22. Von Bergen found on the average 65 grains of cinchonine in one pound; Thiel 0.90 per cent. of cinchonine, and 0.50 per cent. quinine.

e No. 24—27. Von Santen found in one pound 103.210 grains of cinchonine; Wittstock 1.58 per cent. They contain apparently much magnesia.

f No. 28. This bark, judging from the proportion of the ashes, may be considered as spurious. 28 to 32. According to Santen, 2.3 quinine; 0.8 cinchonine. The ashes were also very coherent.

g No. 33. According to Göbel, cinchonine, 0.8; quinine, 1.7 per cent.

h Nos. 34 to 37. According to Geiger, cinchonine, 0.8; quinine, 1.0 per cent.

i Nos. 38 to 41. According to Geiger, cinchonine, 0.8; quinine, 0.1 per cent.

*Relative Proportion of Ashes, Carbonate of Lime, and Caustic Lime,
according to the size of the pieces of Bark.*

	I. Flat pieces, thick quills.	II. Middling-sized quills.	III. Thin quills.
Ashes	1.83 per cent.	1.61 per cent.	2.6 per cent.
Carbonate of lime	1.56 " "	1.01 " "	1.97 " "
Caustic lime.....	0.87 " "	0.60 " "	1.10 " "

I. The larger proportion of lime arose probably from the thicker coat of the older barks. The average percentage was calculated from Nos. 8, 14, 17, 22, 30, 32, 33, 36, 38, 39, 41.

II. The average percentage is calculated from the Nos. 11, 12, 13, 18, 21, 26, 29, 37.

III. The large proportion of lime in this class very likely arises from the lichens, and from the undeveloped state of the albumen [*splint*] the peculiar seat of the alkaloid. The percentage is calculated from Nos. 10, 15, 19, 20, 24, 34, 40.

Average Proportion of the Ashes, Carbonate of Lime, and Caustic Lime.

Name of the Bark.	Ashes.	Carbonate of lime.	Caustic lime.
I. Spurious barks, Nos. 1 to 7	3.1 per cent.	2.5 per cent.	1.45 per cent.
II. China ten pallid., Nos. 15 & 16	3.4 " "	2.5 " "	1.45 " "
III. Lima China, No. 23	3.1 " "	2.1 " "	1.18 " "
IV. China Pseudo Loxa, No. 10	2.7 " "	1.1 " "	0.62 " "
V. China rubra, No. 33	2.7 " "	2.3 " "	1.29 " "
VI. China rubiginosa, Nos. 8 & 9 ...	2.4 " "	2.2 " "	1.23 " "
VII. China flava dura, Nos. 34 to 37 ..	2.1 " "	1.8 " "	1.01 " "
VIII. China flava fibrosa. Nos. 38 to 41 ..	1.9 " "	1.7 " "	0.95 " "
IX. China Huamal. No. 17, to 22 ...	1.8 " "	1.5 " "	0.84 " "
X. China Loxa, Nos. 11 to 14	1.7 " "	1.1 " "	0.62 " "
XI. China Huanuco, Nos. 24 to 27	1.6 " "	0.6 " "	0.34 " "
XII. China regia, Nos. 29 to 32	0.58 " "	0.45 " "	0.25 " "

Archiv. der Pharmacie, May, 1851, p. 159.

ON THE TESTS FOR NITRATES, AND A NEW ONE FOR NITRITES.

BY DAVID S. PRICE, PH.D., F.C.S.

My attention having been directed to the detection of nitric acid in cases where, if it existed at all, its quantity could be but small, I deemed it necessary, as a preliminary step, to ascertain the merits of some of the tests usually adopted for that purpose. The experiments were confined chiefly to two reactions, generally considered the most susceptible for nitrates; the one where the indication of the presence of nitric acid is the production of a dark violet or brown colour, caused by adding a solution of protosulphate of iron and concentrated sulphuric acid to a solution of a nitrate; the other, where it is the destructive action of nitric acid on indigo, the solution of the nitrate being made slightly acid with sulphuric acid, and then a solution of sulphate of indigo added. Before, however, detailing the results I have arrived at with respect to these tests, I shall proceed to describe a new one that has suggested itself for nitrites, but which admits, under certain circumstances, of application also for the detection of nitrates. Thinking that the addition of dilute hydrochloric acid to a solution of a nitrate in presence of iodide of potassium and starch-paste, might cause the chlorine thus liberated to act in the nascent state on the iodide, and so produce the well-known blue colour, I tried the experiment and found it to answer apparently most successfully. I was, however, surprised to find that of several nitrates employed, that of potassa was the only one with which the experiment succeeded; furthermore, that hydrochloric acid was not at all a necessary condition for the production of the blue colour, oxalic, dilute sulphuric, and even diluted nitric acids effecting the same, whilst the same diluted acids produced no

change in a simple mixture of iodide of potassium and starch-paste. It was therefore evident that the action was not dependent on chlorine, but on some substance to be found in nitrate of potassa, and which will be demonstrated by the following experiments.

On distilling a few grains of nitre dissolved in five ounces of water with a small quantity of concentrated sulphuric acid, a distillate was obtained of slightly acid reaction, which when neutralised with carbonate of potassa and concentrated, and then added to a mixture of iodide of potassium, starch-paste, and dilute hydrochloric acid, was found to produce a much deeper blue colour than did a concentrated solution of the original nitrate. This led me to try the effect of the nitrites on the same test-mixture, and which I found to possess the property of liberating iodine under the circumstances described in a most remarkable degree, and which must be attributed to the reduction of hydriodic acid by nitrous acid. On subjecting the nitrate of potassa employed for the foregoing experiments to re-crystallisation, the crystals then obtained were found to have entirely lost the property they originally possessed, whilst the mother-liquor retained it in a high degree, clearly showing that the peculiar action of the nitrate of potassa was to be attributed to the presence of a small quantity of nitrite. It has been shown that a very distinct indication of nitrous acid was obtained in the distillate from ordinary nitre and sulphuric acid; in order to see if such would be the case with small quantities of pure nitre when treated with pure sulphuric acid, I repeated the experiment, employing two grains of the pure salt, six ounces of water, and half an ounce of concentrated sulphuric acid, when, after treating the distillate in the manner before described, abundant proof was afforded of the presence of nitrous acid. In all cases, therefore, where distillation is necessary in searching for nitrates, this test may be indirectly applied for them. Those substances which interfere with the formation of iodide of starch under ordinary circumstances, prevent its production also by the present test. The method of employing the test is the following: A few drops of a dilute aqueous solution of iodide of potassium (free from iodate) are mixed with a little starch-paste, and then dilute hydrochloric acid of specific gravity 1.006 added. The liquid suspected to contain a nitrite, if alkaline, must be slightly acidified with hydrochloric acid and then added to the test-mixture, when, if much nitrite be present, a dark-blue colour will be instantly produced; and if very small traces only, then the liquid first assumes a pale fawn colour, which gradually changes to that of violet, plum, and ultimately dark-blue. The extraordinary delicacy of the test will be seen from the following experiments. When water containing only the $\frac{1}{1000000}$ th part of nitrous acid (as nitrite of soda, NaO, NO_2) is added to the test-mixture, a violet colour is almost instantly produced; with the $\frac{1}{1000000}$ th part, the colour makes its appearance in a few seconds; with the $\frac{1}{1000000}$ th part, after the lapse of two or three minutes; with the $\frac{1}{1000000}$ th part, a change may be observed in twelve minutes, and with the $\frac{1}{1000000}$ th part, a violet tint is produced in about fifteen minutes. In all these cases, the liquid rapidly assumes a dark-blue colour. By performing the experiments in a porcelain basin, the faintest indication of colour may be observed. In searching for minute traces in a very large bulk of liquid, it is advisable to add more iodide of potassium than where the volume of the liquid is small. Since performing these experiments, I find that Schönbein* has noticed the action of nitrites on iodide of potassium.

With respect to the tests for nitrates specified at the commencement of the paper, De Richemont† has found that by the employment of the first one, he was able to detect the $\frac{1}{10000}$ th part of nitric acid in a solution. The one by means of indigo has had narrower limits assigned to it; Liebig,‡ who suggested it, states that the $\frac{1}{1000}$ th part of nitric acid may be recognised by it, and the $\frac{1}{1000}$ th part, when a little chloride of sodium is added. I shall endeavour to show, that in both cases the action is in all probability due to nitrous acid, contained either originally in the substance as nitrite, or produced by the action of sulphuric acid upon the nitrate; at any rate that nitric acid in the cold has no apparent action upon either of them. And, first, as regards the test with sulphate of protoxide of iron. If sulphuric acid be added to a solution of nitrate of potassa free from all nitrite, and briskly agitated with it, so as to prevent the mixture from becoming heated, and then a solution of sulphate of protoxide of iron added, no change whatever in the colour of the liquid will ensue, even when allowed to stand for some time, which could not be the case did the

* J. Pr. Chem. xlv. 227.

† Graham's Chemistry, 297.

‡ Gmelin's Handbuch der Chemie, i., 813.

action of the test depend on nitric acid. If to the same mixture, one drop of a dilute solution of nitrite of potassa be added, a brownish colour will be immediately produced, showing the instantaneous effect of nitrous acid upon the test. If, instead of keeping the mixture of nitrate of potassa and sulphuric acid cold, we gently warm it, and then add a solution of protosulphate of iron and a few drops more of concentrated sulphuric acid, a dark violet colour will immediately appear, accompanied by an energetic disengagement of gas; the colour in this case soon disappears, owing to the heat evolved, but can readily be reinstated by a fresh addition of the protosulphate of iron. Or again, if we first add a solution of protosulphate of iron to the solution of the nitrate, and then pour in the concentrated sulphuric acid in such a manner that it forms a layer at the bottom of the vessel, we shall find that a violet colour will be produced at the contact-surface of the two liquids; the heat in this as in the former case, being sufficient to cause the formation of nitrous acid. In searching, therefore, for small quantities of nitrates, it is advisable to add, as recommended by De Richemont, a large bulk of concentrated sulphuric acid. With respect to the delicacy of this test for nitrites, I have found that a liquid containing the $\frac{1}{1000}$ th part of nitrous acid (in the form of a soda-salt) becomes immediately coloured green upon the addition of a small quantity of sulphuric acid and sulphate of iron; that perceptible shades of green are produced when a liquid contains the $\frac{1}{10000}$ th, and a faint colourization with the $\frac{1}{100000}$ th part. In like manner to the preceding test, I have found that a solution of pure nitrate of potassa which has been treated in the cold with concentrated sulphuric acid, or decomposed with tartaric acid, has no action whatever upon a solution of sulphate of indigo, but that the presence of the smallest quantity of nitrous acid is sufficient to destroy the same. By applying heat to the mixture of sulphuric acid and solution of nitre, to which a few drops of indigo-solution have been added, the colour of the latter will be found rapidly to vanish, and the test then becomes an exceedingly delicate one for nitrates, and in the absence of chlorates and organic matter, may be most advantageously employed for them. I have examined the delicacy of the test for nitrites, and have found that the one, two, and three millionth part of nitrous acid in a solution may be detected by means of it.

By all the foregoing tests it will be found that the sulphuric acid of commerce, as well as most kinds of carbonate of potassa, contain a trace of nitrous acid. In conclusion, I may state that I have applied the nitrites to the detection of the iodides.—*Quarterly Journal of the Chemical Society.*

ON A NEW METHOD OF DETERMINING THE QUANTITY OF HYGROMETRIC MOISTURE IN THE AIR.

BY DR. ANDREWS.

IN the absence of Dr. Andrews, Prof. Stevally made this communication. Dr. Andrews had found on trial that several powders when well dried would rapidly, effectually, and completely, take up the moisture of damp air passed through them, as effectually as the fused chloride of calcium, which is too troublesome in the making, preserving, and using, for common use. For instance, he had found that well dried black oxide of manganese—and a still more universally obtainable substance, powdered alabaster, or sulphate of lime, as dried and prepared by plasterers or by those who make casts—being inclosed in a small syphon, a measured bulk of air passed through either, at a very quick or at the slowest rate, would be so effectually deprived of all its hygrometric moisture that another syphon filled with coarser fragments of fused chloride of calcium gained no weight sensible to a balance which turned with the one-thousandth part of a grain—the measured portion of damp air being in succession drawn through the syphon containing the alabaster and that containing the fused chloride of calcium. The apparatus contrived by Dr. Andrews—a drawing of which Prof. Stevally exhibited and explained—consisted of a gasometer whose bell was attached as a counterpoise to the weight of a Dutch clock sufficiently heavy to work it. By this a measured volume of air was drawn through a tube leading from the open air through the syphon containing the absorbent powder, which was attached to it by collars of caoutchouc, so that after the air had passed through, the syphon could be readily detached, weighed, and the gain of weight by the absorption of the moisture thus determined. In this way he was able in widely various hygrometric states of the air to test the indications of Daniel's and other hygrometers—to determine the correct relation between the depression of the wet bulb and the dew

point—and even to use the apparatus itself as a simple integrating hygrometer by which the total quantity of vapour contained in a measured volume of air drawn through the apparatus, say during twelve hours, at a uniform rate, may be actually determined by weight.—*Report of British Association in the Athenæum.*

ON THE ANTIPUTRESCENT ACTION OF PICRIC ACID, NICOTINE, QUININE, STRYCHNINE, AND OPIUM.

BY M. BORIN.

Picric Acid.—As this acid is capable of combining directly with silk, wool, and skin, and as, in these combinations, the acid enters in sufficient proportion to communicate its colour, I had thought it probable that it would also combine with the different animal substances; and, as we find that products of this kind, even when they result from the combination of two organic bodies, as in the combination of tannic acid with the different tissues, are generally less easily attacked by moist oxygen than are the uncombined tissues, I had concluded that in combining with organized substances, picric acid would prevent slow combustion, and consequently putrefaction. These results have been found practically to occur.

According to my observations, picric acid, when administered to animals during life, in small doses, produces a sedative effect on the nervous system, and acts as a powerful antiphlogistic; in sufficiently large doses it acts as a poison, destroying life by asphyxia.

The Organic Alkalis.—The chemical and physiological analogies observed with reference to the combinations of the hydrocarbons, led me to think that many of the organic alkalis, when introduced into the circulation, ought to be capable, either of themselves, or through the products of their decomposition, of counteracting slow combustion; and that by this mode of action they are capable, when administered in sufficient doses, of producing death, and in doses properly regulated, of diminishing the amount of vitality, or producing sedative or anæsthetic effects.

The organic alkalis form two perfectly distinct groups, those with and those without oxygen. I have studied the action of each of these groups.

Vegetable Alkalis without Oxygen.—I have made a few experiments with these alkalis, and hitherto my previously formed views have been fully realized. I may add that nicotine is also capable of powerfully counteracting the lactic acid fermentation.

Vegetable Alkalis with Oxygen.—The oxygenized vegetable alkalis differ more than the preceding from the type of the volatile hydrocarbons; nevertheless, their solvent power and physiological properties clearly indicate a relationship between all these compounds. The alkalis of this group appear to consist partly of bodies having the characters of wax, and partly of resins rendered basic by the presence of ammonia in their composition. The analogy seemed to me sufficient to render the study of their antiputrescent power interesting.

Quinine and its Compounds.—It is known that cinchona bark is capable of retarding the putrefaction of animal substances, but as it contains a considerable quantity of tannin, which is itself a powerful preservative agent, it was doubtful whether the quinine contributed to the result. The determination of this point being of importance in its therapeutical applications, I made some experiments with quinine itself and with its saline compounds. Quinine and its soluble compounds are antiputrescent, their preservative power increasing with their solubility. The basic sulphate being the least soluble is the least active; the more soluble compounds are more active, and especially the acid sulphate.

Strychnine and its Compounds.—In addition to the class of oxygenized vegetable alkalis, the antiputrescent qualities of which I noticed in a former communication, I have added, besides quinine as above noticed, strychnia and its compounds.

Strychnia requires for its solution 6667 parts of cold water. This solution, which contains only the $\frac{1}{1000}$ of its weight of strychnia, does not possess any sensible antiputrescent properties. Nitrate of strychnia, however, which is a very soluble salt, possesses this property in a high degree, as I have proved by experiment. I have more recently tried the muriate of strychnia, also a very soluble salt, and have found it antiputrescent, but perhaps to a less degree than the nitrate.

Opium, and the Compounds of Morphia.—Smyrna opium, rasped, then mixed with common filtered water, and allowed to remain in the liquor, yields a solution which powerfully retards the putrifaction of any animal matter placed therein.

Sulphate and acetate of morphia, when used in comparative experiments, were found to possess but very little antiputrescent power.—*Comptes Rendus.*

ON THE WATER OF THE PACIFIC AND ATLANTIC OCEANS.

BY VON BIBRA.

THE samples of sea-water examined by the author, were taken in the first half of 1850, about noon, as it was easy by that time exactly to know the longitude and latitude of the spot from whence they were taken.

I. From the harbour of Callao (Peru) about half an English mile from the coast; s. lat. $12^{\circ} 5'$; long. $77^{\circ} 14'$ (Greenwich). Temperature of the water, $15^{\circ} 1 R$; temperature of the air, $19.0 R$; state of the barometer in millimetres, 756.2. *March 14, 1850.*

II. From the harbour of Tocopilla (Algodon Bay) about a quarter of an English mile from the coast; s. lat. $22^{\circ} 6'$; long. $70^{\circ} 15'$. Sp. grav. 1.0278; temperature of the water, 13.9; temperature of the air, $17.5 R$; state of the barometer, 755.6. *February 21, 1850.*

III. Pacific Ocean. From a depth of 70 fathoms (about 420 feet) during a perfect calm; s. lat. $25^{\circ} 11'$; long. $93^{\circ} 24'$. Sp. grav. 1.0264; temperature of the water, $16.5 R$; temperature of the air, $20.0 R$. State of the barometer, 761.0. *March 27, 1850.*

IV. From the same spot, but as usual, 10 to 12' below the surface. Sp. grav. 1.0260; temperature of the water, $19.4 R$.

V. In sight of Diego Ramirez. Beyond Cape Horn, the farthest rocky island on the southern point of America; s. lat. $56^{\circ} 32'$; long. $68^{\circ} 47'$; temperature of the water, $5.8 R$; of the air, $6.9 R$; state of the barometer, 75.12. *April 18, 1850.*

VI. Atlantic Ocean; s. lat. $23^{\circ} 45'$; long. $29^{\circ} 27'$; sp. grav. 1.0244; temperature of the water, $19.5 R$; of the air, 19.5 ; state of barometer, 76.25. *May 12, 1850.*

VII. Atlantic Ocean, almost under the equator; s. lat. $0^{\circ} 47'$; long. $33^{\circ} 20'$; sp. grav. 1.0275; temperature of the water, $22^{\circ} 2' R$; of the air, $22^{\circ} 5' R$. State of the barometer, 755.2. *May 22, 1850.*

VIII. Atlantic Ocean, n. lat. $20^{\circ} 54'$; long. $40^{\circ} 44'$; temperature of water, $20.2 R$; temperature of air, $20.0 R$; state of barometer, 763.1. *June 4, 1850.*

IX. Atlantic Ocean, n. lat. $41^{\circ} 18'$; long. $36^{\circ} 28'$; sp. grav. 1.0287; temperature of the water, $16.6 R$; of the atmosphere, $17.9 R$; state of the barometer, 764.0. *June 18, 1850.*

X. German Ocean, n. lat. $51^{\circ} 9'$; long. $3^{\circ} 8'$ (east of Greenwich); sp. grav. 1.0264; temperature of the water, $13.0 R$; of the atmosphere, $12.0 R$; state of the barometer, 75.86. *July 5, 1850.*

The following is a synopsis of the composition of these various specimens of water:—

	I.	II.	III.	IV.	V.
Chloride of sodium.....	2.4825	2.8391	2.5885	2.5877	2.6333
Bromide of sodium.....	0.0402	0.0441	0.0307	0.0401	0.0420
Sulphate of potash.....	0.1409	0.1599	0.1418	0.1359	0.1327
Sulphate of lime.....	0.1488	0.1449	0.1622	0.1622	1.1802
Sulphate of magnesia ..	0.0947	0.1041	0.1117	0.1104	0.1079
Chloride of magnesium ..	0.3681	0.3852	0.4884	0.4345	0.3802
	3.2752	3.6773	3.5233	3.4708	3.4763
Water.....	96.7248...	96.3227...	96.4767...	96.5292...	96.5237
	100.0000	100.0000	100.0000	100.0000	100.0000

In the water of the Atlantic and German Oceans were found:

	VI.	VII.	VIII.	IX.	X.
Chloride of sodium.....	2.7558	2.7892	2.6424	2.9544	2.5513
Bromide of sodium.....	0.0326	0.0520	0.0400	0.0500	0.0373
Sulphate of potash.....	0.1715	0.1810	0.1625	0.1499	0.1529
Sulphate of lime.....	0.2046	0.1557	0.1597	0.1897	0.1622
Sulphate of magnesia ..	0.0614	0.0584	0.0678	0.1066	0.0706
Chloride of magnesium ..	0.0326	0.3332	0.4022	0.3916	0.4641
	3.2585	3.5695	3.4746	3.8422	3.4383
Water.....	96.7415...	96.4305...	96.5254	96.1578	96.5617
	100.0000	100.0000	100.0000	100.0000	100.0000

Chlorine was found in very small proportion, in I., 0.0096; in II., 0.0102; in IV., 0.0098; in VIII., 0.0110; and in X., 0.0087.—*Ann. d. Chem. u. Pharm.*, Bd. lxxvii., and *Central Blatt*, No. 23, 1851, p. 362.

ON A NEW SOLVENT FOR EXTRACTING CANTHARIDIN, AND
ON THE EXISTENCE OF THAT PRINCIPLE IN CANTHARIS VITTATA
AND MYLABRIS CICHORII.

BY MR. WILLIAM PROCTER, JUN.

THE remarkable solvent power possessed by chloroform that has already been developed, and especially the discovery of Rabourdin, that some of the vegetable alkalies come within its capacity, led me to query whether it would not also dissolve the active principle of cantharides. On making the trial with some pure cantharidin it was found to dissolve it with great readiness.

An ounce (480 grs.) of Spanish flies in powder, and two ounces of chloroform, were macerated together for forty-eight hours, and thrown on a glass percolator, the diaphragm of which consisted of a thick sheet of lint, and fitted with a cover to prevent loss by evaporation. The superior density of the menstruum causes the flies to float in it, for which reason it is better, after the solution has drained off, to place a heavy diaphragm on the flies, and return the solution to the percolator; after it had passed a second time, a little chloroform was added, and finally alcohol .835, until all the first menstruum has passed, which is known by the difference in density and colour of the alcoholic liquid, which contains the brown colour left by the chloroform.

By spontaneous evaporation, the dark green chloroform solution yielded a crop of crystals of cantharidin, admixed with the green fixed oil peculiar to the insect; the whole residue weighed forty-three grains. After standing forty-eight hours, that the crystals should have time to separate, the whole was thrown on several thicknesses of filtering paper to absorb as much as possible of the oil. The crystals were then dissolved in a mixture of chloroform and a little alcohol, and by spontaneous evaporation were obtained in nearly a pure form.

The particular merits of chloroform as a menstruum in making cantharidin, are, that it is a better solvent than ether or the oils; that a less quantity can be used with more effect, employing alcohol to displace it, and that the cantharidin crystallizes more readily from chloroform than from ether. The expensiveness of chloroform precludes its use in the preparation of the ordinary blistering liquids, or tissues, but where the object is to isolate the cantharidin, the advantages above mentioned, together with the fact that most of the chloroform may be regained by distillation, will render its use altogether eligible.

Cantharis vittata.—Not being aware of any chemical examination* of this insect with a view to demonstrating the existence of cantharidin in it, I have applied the solvent property of chloroform to this purpose. One hundred and twenty grains of the flies, reduced to powder, were percolated with chloroform, slowly added, until three times the weight of the flies had passed. The tincture had a greenish brown colour, the brown predominating. A few drops of this by evaporation on glass, deposited a coating of minute crystals visible to the eye, and their shape discoverable with a common lens. The whole of the chloroform solution was then suffered to evaporate in a suitable vessel, and yielded a residue of twelve grains. This consisted of crusts of minute crystals admixed with a greenish brown fixed oil, the latter in much less quantity than the green oil obtained in the same manner from Spanish flies. The whole was laid on thick filtering paper to absorb the oil, the crystalline matter dissolved in a little chloroform and alcohol mixed, which by spontaneous evaporation yielded it in a much purer form, though not entirely colourless. The cantharidin appears to be associated with less fixed oil in the potato fly than in the Spanish insect; the oil has much less colour and is more fluid. The cantharidin separates in sword-shaped prisms, terminated obliquely.

Myiabras cichorii.—Having in my possession a specimen of the Chinese blistering fly, *Myiabras cichorii*, the same trial was made with it. One hundred and twenty grains, in powder, was percolated with chloroform till exhausted. The solution possessed a deep brown colour, without a tinge of green. A few drops evaporated yielded a crop of crystals admixed with a transparent brown oily matter. The

*Cantharidin was extracted from these insects by Dana.—(Schweigger's *Journ.*, xxx, s. 247).—*Ed. Pharm. Journ.*]

crystals were larger than those yielded by either of the preceding flies under the same circumstances. The tincture was then suffered to evaporate spontaneously, and yielded an oily crystalline residue, weighing fourteen grains. The crystalline matter was separated from the brown oil by absorption with filtering paper, and was purified in the same manner as in the preceding experiments. The crystals correspond in shape with cantharidin from the two varieties of cantharis.

In stating the weight of chloroform extract obtained from each of the three species of insects examined, no conclusive evidence can be drawn relative to their activity, as in the two first experiments the flies were not exhausted. Besides the amount of oil and colouring matter varies, and as the whole of the cantharidin in neither case was isolated from the extract, its absolute amount is undetermined. The fixed oil must be well pressed out from the crystals before purifying them by recrystallization.

In order to feel assured that the substances obtained were really the blistering principles of the insects, a small quantity of each mixed with a little oil was applied to my arm, and left on for eight hours. Vesication had occurred before their removal in each instance, but more perfectly with the Spanish and Chinese flies than the indigenous variety, owing, as was afterwards observed, to the crystals of cantharidin in the latter substance not being properly comminuted and disseminated through the oil. On the application of cerate, however, they were all equally developed.—*American Journal of Pharmacy*.

METHOD OF OBTAINING OXYGEN FROM ATMOSPHERIC AIR.

BY M. BOUSSINGAULT.

LAVOISIER resolved atmospheric air into its constituents by keeping a confined portion for twelve days in contact with mercury heated nearly to its boiling-point. Boussingault has attempted to use baryta for the purpose of extracting the oxygen from the atmospheric mixture in larger proportion. The method is simple—the air is conducted over pieces of baryta at a dark red heat until it has become converted into peroxide of barium; the oxygen is subsequently again expelled by the application of a more intense heat. The moisture and carbonic acid usually present in the air do not materially interfere with the process. The baryta, however, contained so much alumina and silica, that after repeated use it became caked, and hence no longer of any use. Pure baryta was free from this inconvenience. According to Boussingault, on the large scale, on using ten kilogrammes of baryta, which absorb 730 litres of oxygen, and should again part with it, 600 litres is the quantity always obtained in practice. Hence with furnaces in which 100 kilogrammes of baryta distributed in eight or ten tubes can be heated at once, from 24,000 to 30,000 litres of oxygen may be produced in twenty-four hours.—*Comptes Rendus*, vol. xxxii, p. 266.

DETECTION OF PHLORIDZIN IN DISULPHATE OF QUININE.

PUT the suspected salt in a porcelain capsule and pour over it a few drops of nitric acid. If no change of colour result phloridzin is absent. Should, however, phloridzin be present, the mixture becomes first yellow, then green, and finally dark brown.—*Journ. de Pharm. d'Anvers*.

ON THE SYRUPS OF TOLU AND GINGER.

BY MR. JOHN D. FINLEY.

(Extracted from an Inaugural Essay on Syrups).

Syrup of Tolu.—As this syrup is prepared in the present Pharmacopœia [Edit. 1840] it is in the form of a mixture; in the new Pharmacopœia it will be prepared from an aromatized sugar, obtained by adding the tincture to sugar, allowing the alcohol to evaporate, and making it into syrup the usual way. As thus prepared, it shows a slight milkiness. A better plan is the following, by which a syrup may readily be made of double the strength of that of the Pharmacopœia, and perfectly clear:—

Take of Tincture of tolu, two fluid ounces
Carbonate of magnesia, two drachms
Sugar, a pound and a half (avoirdupois)
Water, twelve fluid ounces.

Rub the tincture of tolu with the carbonate of magnesia and two ounces of the sugar,

in powder, gradually add the water, and filter. The remainder of the sugar is then dissolved in the filtered liquid by means of a gentle heat.

Syrup of Ginger.—A stronger and more perfect syrup can be prepared by making a ginger water by the process directed above for syrup of tolu, and dissolving the sugar in it with a gentle heat.

[We have tried Mr. Finley's processes as given above, and find them to produce syrups agreeably aromatic, especially in the instance of ginger. An accidental advantage of the use of magnesia in the preparation of syrup of tolu, is the saturation of the benzoic and cinnamic acids: on the other hand, one-seventh of the menstruum is alcohol, which in a great measure remains in the syrup, and gives it an alcoholic flavour. If this was removed without injury to the aroma, the formula would be unexceptionable. In the ginger syrup, the proportion of alcohol is less, and its presence is hardly perceptible. The aromatic taste of this syrup, derived from the volatile oil is perfect, but the pungency which depends on the soft resin, is less marked than in the officinal syrup, although sufficiently so to render it very agreeable, especially for mineral water purposes.—EDITOR].—*American Journal of Pharmacy*.

ON BONE OIL.

BY DR. T. ANDERSON.

DR. ANDERSON having discovered picoline in coal tar, was led to investigate the well-known and peculiar fetid oil called bone oil, and, to obtain the best results, operated in the last experiment upon 250 gallons of the distilled bone oil, and discovered at least three different series of bases in the oil. In the first he had established the existence of the bodies called methylamine, ethylamine, butylamine, petinine and probably others; in the second series, picoline, and other bodies of which it is the type. The third series is very remarkable, and all the members of it are characterized by decomposing by heat and excess of acid into bases of the picoline series, and a remarkable and peculiar red or orange-coloured resinous substance. This extensive investigation was not yet concluded; but the oil, besides these bases, contained benzole and the nitriles of some of the fatty acids.—*Report of British Association in the Athenæum*.

CASE OF POISONING BY TINCTURE OF ACONITE.

BY JOHN TOPHAM, M.D. LOND.

A WOMAN, twenty-seven years of age, labouring under the effects of anæmia, conjoined with leucorrhœa and gastrodynia, had a prescription given her, consisting of citrate of quinine and iron, dissolved in water. The dispenser, owing to some error in compounding, added half an ounce of tincture of aconite to the eight-ounce mixture ordered. At eleven o'clock in the morning, she took one tablespoonful of the above compound, and immediately felt a sensation of numbness in the tongue, accompanied by difficulty of swallowing; soon afterwards she began to cry violently, this act being accompanied by convulsive twitchings of the facial muscles. Immediately after this she lost the power of walking, and began to eject a quantity of mucus from the stomach. At half-past two o'clock I saw her, and observed the following symptoms, which, joined to the details just mentioned, caused me to suspect that aconite had been taken. She was lying upon a sofa, resting upon her back, with her eyelids closed, and the pupils slightly contracted. She was quite unconscious when spoken to, and during an hour's observation she only spoke intelligibly twice, and then said, "What is it?" Every now and then she uttered a peculiar plaintive cry. She was continually moving her tongue round the interior of her mouth, from time to time thrusting the organ out beyond the lips, and moving it from side to side. The pulse was weak, but regular. The bystanders said that it had been intermittent. The hands and feet were cold. There was constant lachrymation, inasmuch that a woman was continually wiping the sufferer's eyelids with a handkerchief. The intensity of symptoms varied greatly; sometimes she would lie quite still for several minutes, and then all at once be seized with a paroxysm of sighing, every now and then exclaiming, "What is it?"

I gave her sesquicarbonate of ammonia, with compound tincture of cardamoms, and hot brandy and water, ordered her bed to be warmed, and had her taken up stairs. Having, to a certain extent rallied, she managed to go up a steep staircase, assisted by one person. She said that "her face felt very large," and that "all her

teeth were coming out." During the night she had very little sleep, her rest being disturbed by dreams that she was falling from a height.

The next day she complained of pain in the lower part of the back, and of a numbness in both arms, but these sensations soon subsided, and no ill effects remained. After recovering, she stated that she had not the slightest recollection of what had occurred during two hours—i. e., from half-past twelve till half-past two o'clock.

Remarks.—The above is a good illustration of the effects of a poisonous dose of a preparation of aconite. At first sight the symptoms might have led to a suspicion that hysteria was the cause of the phenomena observed, but the sudden loss of sensation in the branches of the fifth nerve distributed upon the mucous lining of the tongue and the interior of the mouth, followed by vomiting, paralysis of sensation in the arms, &c., sufficed to suggest that poison had been taken, and that that poison was aconite.

The case also illustrates the uncertainty in the effects produced by the preparations of this substance, and suggests the degree of care which should be taken in prescribing them.

The exact quantity of aconitina contained in the tincture given in the present instance it is impossible to determine, owing to the inadequacy of our tests for that alkaloid; but upon inquiry at the manufacturer's, it was found that the tincture had been prepared by macerating four ounces of the root in one pound of spirit. Of this the patient had taken fifteen minims; a small dose, but one which, from a remark made by Professor Taylor, upon the authority of Dr. Pereira, would appear amply sufficient to occasion dangerous symptoms.* Of course the strength of the tincture employed must be here taken into account, and this varies extremely; that prepared according to Dr. Fleming's directions consisting of powdered tubers and rectified spirit, in the proportion of sixteen ounces (Troy) to sixteen fluid ounces, and there being some five or six other formulæ known.† Pereira states that the 50th part of a grain of aconitina has sufficed to endanger the life of an individual;‡ and the late Dr. Male, of Birmingham, died from the medicinal effects of eighty or eighty-seven drops of Fleming's tincture, taken at ten doses spread over a period of four days, the largest quantity swallowed at one dose being ten drops,§ whilst a case of recovery, after a dose of two grains and a half of aconitina, has been related by Dr. Golding Bird.||—*Lancet*, July 19, 1851.

[The *Tinctura aconiti* P. L. is made in the proportion of fifteen ounces of the root to two pints of spirit, and we have seen the dose stated as from five to ten minims, or even more. According to the above case, fifteen minims of a tincture, not much more than half the strength (four ounces to a pound of spirit), produced very serious results. We may, therefore infer that the maximum dose of the Pharmacopœia tincture, as usually stated, is much too strong.—Ed. *Pharmaceutical Journal*.]

POISONING BY OIL OF BITTER ALMONDS.

On the 7th instant, an inquest was held at Bishopsteignton, Devonshire, on the body of a young lady, Miss Jane Emily Wyse, who was found dead in her room at the house of Mr. and Mrs. Hele, on her return from an archery meeting, as long ago as the 14th of May last. On the day after her death the coroner attended and made inquiries, when Mr. Gors, a surgeon, having stated his opinion to be that *the young lady died in a fit*, it was thought unnecessary to hold an inquest. Since that time suspicions having arisen that she died from the effects of poison, and her uncle, Major Ellison, of Boulton Hall, Lincolnshire, having written a letter to Mr. Hele declining to receive that gentleman and his lady as visitors to his house, Mr. Hele, to remove any suspicions, thought it desirable that an inquest should be held. The body was consequently exhumed, and Mr. Herapath, of Bristol, employed at the investigation before the coroner's jury. Mr. Herapath gave it as his opinion that the death of the young lady was occasioned by prussic acid. Witnesses were examined to show that she had been in the habit of using essential oil of almonds, and a letter, which was found in her desk after her decease, put in evidence, in which were the words, "I

* Taylor *On Poisons*, 1848, p. 765; and *Medical Jurisprudence*, 1849, p. 187.

† *Pharmaceutical Journal*, 1847, p. 176.

‡ *Materia Medica*, vol. ii., 1841.

§ *Provincial Medical and Surgical Journal*, 1845, p. 585; and *British and Foreign Medical Review*, vol. xx., p. 469.

|| *Medical Gazette*, January 6, 1848.

have thought it not improbable that I might die suddenly," and requesting certain trifles to be distributed to her friends. The jury returned a verdict, that she came to her death by taking essential oil of almonds, but whether with the intention of putting an end to her life or not they could not say.

TRIAL AND ACQUITTAL OF A COFFINITE.

CENTRAL CRIMINAL COURT.—August 23.

JOHN STEPHENS, of Ratcliff Highway, grocer, surrendered to take his trial on a coroner's inquisition, charging him with the manslaughter of Harry Stewart Davis.

Our last number contained a brief report of the inquest. It transpired on the trial that John Stephens carries on the business of potato salesman on one side of his shop, and that of grocer on the other; and that he also practises as a quack doctor. The powder administered to the deceased is sold in large quantities under the name of "Composition powder." The enema contained some of this powder with the addition of lobelia and valerian.

One witness (the shopman who had sold the powder) stated that he had taken pounds of it himself, and it had never done him any harm. He had also taken lobelia. The "composition powder" was said to consist chiefly of "bayberry bark and hemlock spruce bark." Dr. Letheby stated that he detected chiefly cayenne pepper and ginger. Being a vegetable compound the exact composition could not be ascertained by analysis. It was, however, proved to be a powerful stimulant.* The intestines of the deceased were found to be in a very inflamed state, but there was also organic disease of other parts, which gave the prisoner the benefit of a doubt.

Mr. Justice Wightman in summing up, explained to the jury, that the principal question for their consideration was whether the prisoner had been guilty of such gross rashness or exhibited such gross ignorance in his treatment of the deceased as occasioned his death, and in that case only would they be justified in finding him guilty of manslaughter. It would be very hard indeed upon a medical man, or any other person, if because the patient he was attending died he was to be subjected to a charge of manslaughter; and if it were to be so, very few men would like to incur the responsibility of practising the science of physic. Did the evidence in the first place satisfy the jury that the medicine was of a poisonous and dangerous character? They had heard the testimony of the witnesses on this point, and it also appeared that the medicines had been taken by some of the parties, who had derived great benefit from them. He was bound to tell them, that the fact of these having failed in one instance, was not sufficient to make out a case against the defendant, although it might appear that it would be improper to administer such medicines in a case where the stomach was already in a state of inflammation, yet there did not seem to be any evidence to show that the prisoner was aware of the fact. His lordship then read over the evidence, commenting on the material parts as he proceeded.

The jury immediately returned a verdict of not guilty.

[In accordance with the charge of the judge they could not have returned any other verdict: nor indeed on the principle laid down could a verdict of guilty be returned in any case of death under the treatment of a quack. In the first place, the same allowance is conceded which would be made in the case of a Medical Practitioner who possessing full qualification, and using due care, skill, and attention, had failed to cure his patient: and then the fact that the quack was ignorant of the condition of the patient is admitted as an excuse for the administration of improper medicines. While this maxim is adhered to there is more protection and encouragement given to quacks than to qualified Practitioners. We maintain that in the case of a qualified Practitioner, where the propriety of the treatment is called in question, the *onus probandi* should rest with the accuser, because it is fair and right to infer, in the absence of evidence to the contrary, that a qualified professional man has availed himself of his skill and experience in the treatment; but in the case of the quack the *onus probandi* should rest with the accused, who having undertaken that for which he is not legally qualified, cannot be expected to possess the requisite skill and experience.—ED.]

* Dr. Coffin in his book, gives two formulæ for "Composition powder"—Bayberry, 4oz.; pinus canadensis, 2oz.; ginger, 2oz.; cayenne, ½oz.; cloves, ½oz.; all finely pulverized and well mixed. Ordinary dose a teaspoonful in a cup of hot water sweetened.—Or bayberry, 4oz.; Pinus canadensis, 4oz.; ginger, 4oz.; golden seal, 2oz.; sassafras, 2oz.; cayenne, ½oz.; cloves, ½oz.

HOMŒOPATHIC CANDIDATES.—(*Edinburgh University.*)

Sundry printed letters and pamphlets in the homœopathic interest have been extensively circulated of late in this city* and elsewhere, relative to proceedings in the Royal College of Physicians and in the University against the delusions of homœopathy. Our readers will scarcely thank us, were we to make these productions the subject of criticism: but, as several of them make use of an incorrect account, which has been given in an homœopathic periodical, of a recent decision of the Medical Faculty in the case of a candidate for medical honours and homœopathic distinction, we feel compelled to supply the professional public with a truth version of the whole matter. If we thus violate, for the first time, the well-understood compact between examiners and candidates in this University—that the fact and circumstances of failure shall be confined to themselves—the individual principally concerned has himself alone to blame. He must take the consequences of his own ill-advised publication, and his perverted report of the proceedings.

Mr. Alfred Crosby Pope, having appeared before the Second Division of Examiners of the Medical Faculty in the middle of June, underwent the usual written examination on the practical branches of medicine and surgery, and was afterwards subjected to an oral examination on the same subjects. He had satisfied several of the examiners; but his surgical knowledge was evidently defective. While under examination in Midwifery, he was asked what doses of calomel, opium, tartar-emetic, and aloin he would give in certain diseases; in reply, he stated correctly the doses usually given in medical practice; and when asked whether these were the doses which he would himself prescribe, he replied they were. He then underwent an examination on *Materia Medica*, the professors of that branch and of clinical surgery being present. His replies were satisfactory enough; the only objection of any moment indeed being, that his doses of medicines were somewhat large. The Faculty having been furnished with positive information that Mr. Pope has avowed his purpose to become a homœopathic practitioner after graduating, it was determined that he should have an opportunity of answering to the charge. The question was put to him by Dr. Christison, and the following are the very words of the conversation that ensued:—"Well, Mr. Pope, I am satisfied so far with your answers; but there is another point on which I wish to be informed; and as it is best not to beat about the bush, I shall put to you a plain question, in order that I may get a downright answer. I am told by a colleague that he has been informed on good authority, that it is your intention to become a homœopathic practitioner after you graduate; after the answers you have this day given me, I feel bound to say I do not believe it. Am I right?" To which Mr. Pope replied, "I am not now a homœopathist; but, after graduation, I mean to inquire into the truth of it." Professor Syme then remarked, "Now, Mr. Pope, suppose that this inquiry which you meditate were to confirm your belief in the truth of homœopathy, what would you do with the diploma received from us? would you burn or return it?" "No," replied he, "I would keep it." "For what purpose?" "To show that I had regularly studied." "Studied what? Delusions! Fallacies! Nonsense! It would only show that you had misspent four or five years of your life in studying what could not possibly be of any service, according to your own view; and I am sure that on reflection you must see, how inconsistent it would be with common honesty or common sense to use a diploma, after ceasing to entertain the principles which were professed in order to obtain it. But recollect, Mr. Pope, I offer this remark to you as a friend, and not as a professor." Mr. Pope then withdrew, and in what remained of his examinations he made a satisfactory appearance, except in Medical Jurisprudence, in which, as in Surgery, he was defective.

The case being a new one, it was referred by the examiners to the whole Medical Faculty for decision. Of the thirteen members, eleven were present. After considering the whole circumstances, the Faculty unanimously resolved—"That serious doubts are entertained as to the soundness of Mr. Pope's principles of practice; and that on this account, as well as his insufficiency on some subjects of examination, he shall be remitted till the end of July, by which time he will have had ample opportunity of making the inquiry into the truth of homœopathy, which he says he contemplates." This resolution, which admitted of his graduating this year, in the event of his satisfying the Medical Faculty, was communicated to him in conversation by the Dean. Mr. Pope, however, withdrew at once from the list of candidates.

This is a correct narrative of the whole official proceedings. Any thing else that

* Edinburgh.

may have been said to the candidate privately by individual professors, could have been said in kindness only, and by them as individuals alone, and is wholly irrelevant.

We must add a single word for the information of distant friends of the University, who may be led to surmise that the misfortune of this young man in some measure justifies the fears expressed in some quarters, lest students may be infected with the delusions of homoeopathy while studying at Edinburgh. The Medical Faculty had distinct evidence, which will be produced, if necessary, that, when Mr. Pope came to study here three years ago, he avowed that he had practised homoeopathy, and came to study for a degree, in order to settle as a homoeopathic practitioner. This determination was repeated afterwards; and it could neither have been engendered nor strengthened by any instructions received within the walls of the University, for the principles and practice of homoeopathy have never been taught there by any professor.—*Monthly Journal of Science, Edinburgh.*

REVIEW.

A TRANSLATION OF THE NEW LONDON PHARMACOPEIA, including the *New Dublin and Edinburgh Pharmacopæias*, with a full Account of the Chemical and Medicinal Properties of their contents; forming a *Materia Medica*. By J. B. NEVINS, M.D., Lond., &c. &c. &c. Small 8vo, pp. 780. London: Longman and Co.

We regret to be compelled to speak unfavourably of Dr. Nevins's Translation, but truth obliges us to say that we consider it to be a hastily got up work, badly arranged, ill digested, and abounding in blunders.

That it has been hastily got up is obvious from the numerous typographical errors, and the presence of both an "Appendix" and "Addenda" for articles which have been "accidentally omitted in their proper place." Typographical errors are as "plenty as blackberries;" for example, "Thompson" for "Thomson," "Brande" for "Brandt," Camphora "officinalis" for Camphora "officinarum," Krameria "triandria" for Krameria "triandra," Juniperi "cucumina" for Juniperi "cacumina," &c. &c.

The bad arrangement of the work is shown by the fact that the important articles of the *Materia Medica* are made subsidiary to their preparations. Thus opium, cinchona bark, nuxvomica, and veratrum album are placed in the division "*Alkalina*;" the turpentine under the head of "*Cerata*;" cassia fistula under that of "*Confectiones*;" aloes, chimaphila, and the poppy in the division of "*Decocta*," &c. &c.

Blunders abound through the work, and will be found in almost every page; and many of them are of so ludicrous a nature that their adoption by a student would lead to his almost certain rejection at any examining board. What will our dealers say when they are informed that catechu comes from Jamaica, quicksilver from Mexico, black pepper from the West Indies, sarsaparilla from the East Indies, and American turpentine from the North of Europe?

Dr. Nevins's Chemistry is not the Chemistry of the present day. Benzoic acid, he tells us, is the active principle of the balsams of Peru and Tolu, and of storax, none of which substances are known to contain an atom of this acid. The active principles of wheat-starch, he says, are "starch, gluten;" and, of groats, "starch" only. So that he assigns a nitrogenized principle to a substance which does not contain it, and omits to mention its presence when he ought to notice it. Salicina is said to be distinguished from all other vegetable principles by its becoming blood red on the addition of sulphuric acid, and yet a few pages further on we are informed that *veratria* forms a blood red colour with sulphuric acid! As an objection to what he is pleased to call the "organic theory" of vinous fermentation he says that, "when solution of pure sugar is fermented, the quantity of yeast gradually diminishes, and fermentation soon ceases, and it is only when *gluten* is present, as in wort, that its quantity increases, whereas on the theory of germination, the yeast increases at the expense of the sugar." As yeast is an organized body, containing both nitrogen and sulphur, it obviously cannot increase when these principles are absent; and we have yet to learn that any person ever supposed it could. But when gluten, or some other allied principle, is present in a saccharine solution, yeast cells are developed, and then vinous fermentation commences, and the yeast plant continues to increase and grow so long as both nitrogenous and non-nitrogenous foods are present, provided other conditions (e. g. temperature, &c. &c.) are favourable.

At page 336 we are told that mica is sulphate of lime (!); and at p. 341 a wood-cut of an octohedron is given to represent the crystal of alum. Unfortunately, how-

ever, the crystalline form of alum is a regular octohedron, and Dr. Nevins has figured another octohedron, the precise form of which we cannot make out from his figure, but believe it to be intended for the octohedron with a rhombic base; certainly, it is not the regular octohedron.

Dr. Nevins tells us that the "accidental adulteration" of disulphate of quinine with sulphate of cinchonia "is of no consequence, medicinally speaking," and, therefore, as the College has given no process by which this adulteration can be detected he does not think it necessary to do so. But considering that sulphate of cinchonia is only one-third the price of disulphate of quinine, we apprehend that to Medical Men and Chemists it is of consequence not to pay for sulphate of cinchonia three times its value.

Benzoin, we are told, "consists of resin, gum, and some other unimportant ingredients, and benzoic acid." Now we should be glad to know on what authority he asserts the presence of gum in benzoin?

Nitric acid, Dr. Nevins tells us, cannot exist unless combined with water as a base; but Deville has shown that it can, and that anhydrous nitric acid is a crystalline substance.

At p. 101, Dr. Nevins confounds anhydrous sulphuric acid with Nordhausen acid.

The *pulvis antimonialis* of the Dublin Pharmacopœia is said to be "similar" to the *pulvis antimonii compositus* of the London Pharmacopœia; yet the former contains the antimony in the state of teroxide, the latter in that of antimonious acid!

The formula given by Dr. Nevins for ammonio-citrate of iron is $\text{Am } \bar{\text{C}}, \text{Fe } \text{O}_{1\frac{1}{2}} \bar{\text{C}}, \text{HO}$. Adopting his equivalents, a compound having this constitution would contain less than twenty-two per cent. of sesquioxide: yet he tells us, on the authority of the Pharmacopœia, that the ammonio-citrate yields about thirty-four per cent. of sesquioxide!

The above are a few specimens of the errors which pervade the book.

We can assure Dr. Nevins that we took up his work in no unfriendly spirit, but with the desire to give a favourable notice of it; and we regret that we cannot recommend it to our readers. Some of the errors may have resulted from the hasty manner in which the book has been got out.

TO CORRESPONDENTS.

Corrector.—When drops are ordered in a prescription, drops and not minims should be used. The variation in the size of drops was pointed out by Mr. Alsop, whose remarks on the subject with a figure of his minim-meter we published, vol. i., p. 327.

Chemicus.—Chloride of zinc may be prepared by dissolving zinc or its oxide in hydrochloric acid, evaporating to dryness and fusing in a glass vessel.

E. A. (Bradford, Wilts).—(1.) It is not absolutely necessary.—(2.) Probably in two or three months.

H. G. C.—The substance does not possess the characters of carbazotic acid. Carbazotic acid is yellow, has a bitter taste, and fuses and sublimes at a gentle heat. The specimen is white, tasteless, and neither fuses nor sublimes at a dull red heat.

W. P. (Bridgewater).—Lardner's *Cyclopædia*, the two volumes on Electricity and Magnetism, edited by Mr. Walker.

A. Z. (Leicester) *A Dispenser* (Colchester) *A Dispenser* (Nottingham.) **W. H. L. (Birmingham.)** *A Student* (Clapham) would be entitled to registration.

A Country Druggist.—The Arsenic Act does not interfere with the sale of arsenic by wholesale to retail dealers upon orders in writing in the ordinary course of wholesale dealing. For agricultural purposes arsenic must be coloured as the Act directs.

John Peacock.—The document has been received.

R. E. (Thornbury).—**TINCTURE OF SUMBUL.**—In the absence of any formula published on authority, we have adopted the following:— $\bar{\text{R}}$ sumbul, 2oz.; proof spirit, 16oz.; macerate seven days and strain.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.

Other Communications to the EDITOR.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. IV.—OCTOBER 1st, 1851.

COMPULSORY AND VOLUNTARY EDUCATION.

IN our number for November, 1843, we adverted to this subject, and contrasted the system of compulsory attendance at hospitals and medical schools with the experiment of voluntary education, in which the Pharmaceutical Society had at that time recently embarked.

The candidate for a diploma as a Medical Practitioner, is required to produce certificates of attendance at a recognised school during a period prescribed by the regulations. Certain courses of lectures, the number of which is defined, must be attended—that is to say, certificates to that effect must be produced. In the case of the Apothecary, indentures of apprenticeship are required, and in the Universities, evidence must be produced to show that the candidate has undergone a sufficient preliminary education.

Notwithstanding the stringency of these regulations, and the exertions which are made to coerce the student into the right path, the result is not uniformly successful. In every school or college there are “reading men,” who derive the full benefit from the advantages before them; and “fast men,” who evade the regulations, neglect their studies, and trust to the “grinder” for success at their examination. The object with the latter class of students, is to pass with the least possible trouble, and to obtain a diploma representing the minimum amount of knowledge allowed by law. Without compulsion, they would scarcely take the trouble to study at all, and under any circumstances, are not likely to attain more than a superficial knowledge of their profession.

Other students, and we believe a considerable proportion, may be more easily led than driven. They are sensible of the value of knowledge and experience in the art and science of their profession, and, if properly directed, and furnished with the means of improvement, they require no Act of Parliament to induce them to study. It has always been a disputed question to what extent the *vis à tergo* is necessary or desirable for the propulsion of students. There are many advocates of voluntary education, who consider that when a youth has left school, and embarked in the avocation which is to be the future business of his life, he might be left to his own discretion, and that common sense would dictate the importance of industry. At all events, they maintain that each individual would find his level; that those who neglect the advantages of improvement which are before them in early life will be themselves the sufferers, and that their fate will be a warning to others. This principle may be a correct one in regard to those avocations in which want of skill and knowledge only injures the individual himself, but in a profession relating to the public health and the treatment of disease, the question of qualification affects the public as well as the practitioner. It is on this ground that Acts of Parliament have been passed to regulate and enforce the education of medical men. In the absence of the requisite powers for extending this provision to the department of Pharmacy, the Pharmaceutical Society was established on the voluntary system. Not only is the passing of the examination voluntary, but the mode in which the candidates qualify themselves is left to their own discretion. Lectures are provided, and other means of instruction are offered to the student on very moderate terms, but attendance is not compulsory. The further experiment of throwing open the lecture-room during the present session to all Members and others connected with the Society, will test the voluntary system to the fullest extent. It will be seen how many young men will volunteer to accept education when offered free of charge.

THE SCHOOL OF PHARMACY. SESSION 1851—2.

THE Tenth Session of the School of Pharmacy, in Bloomsbury Square, is about to commence, under favourable auspices. Every place in the laboratory is engaged. The chemical room up-stairs has hitherto been reserved for the more advanced pupils, and but little used at the commencement of the session. On the present occasion this room will be called into requisition on the opening of the school, and every compartment will be immediately occupied.

The number of pupils thus engaged on the establishment will form a respectable class in the Lecture-room; and as the Lectures, during the present session, will be free to all Members and Associates of the Society, as well as registered Apprentices, the attendance ought to bear some ratio to the facilities now offered to the student. Those who desire to attend the Lectures of the Pharmaceutical Society must avail themselves of the opportunity during the present session. We stated in our last number, that some change in the management of the school would take place during next year. If a Pharmacy Bill should be passed during the approaching session, the Society would be under the necessity of resigning its educational functions, and, in case the passing of the Bill should be deferred, some modification in the arrangements would be necessary. Under any circumstances it is highly desirable that the attendance should be such as to show that the advantages of Pharmaceutical education are becoming more fully appreciated by the rising generation, and that the Members of the Society are desirous of encouraging this advancement.

PROPOSED BOARD OF EXAMINERS FOR SCOTLAND.

At the last Meeting of the Council, the propriety of establishing a Board of Examiners to sit in Edinburgh was considered, and after some discussion, a Resolution was passed, which will be found in the Transactions of the Society, page 150 of this number.

It was the opinion of the Council that the establishment of the proposed Board was desirable, but that before this could be decided upon, it was necessary to confer with the Members in Scotland. It must be ascertained whether those who had expressed a desire for the appointment of such a Board, were prepared to undertake the labour and responsibility of carrying the measure into effect. All that the Council could do, was to pass a Resolution, expressing a disposition to entertain a proposition on the subject.

The suggestion was favourably received by the Members in Edinburgh, who formed themselves into a Committee, and met several times for the purpose of considering the nature of the proposition to be transmitted to the Council. The official report of the result cannot appear in the Transactions for the present month, as the Meeting of the Council will not take place until after this number is printed; but we are enabled to give an outline of the proceedings in Edinburgh, with the general scope of the conclusions at which the Committee arrived.

The first question which arose, had reference to the constitution and jurisdiction of the Board, and this involved a broader and more important question, namely, whether the proceedings should be conducted under the Charter of the Pharmaceutical Society of Great Britain, or by a separate Society to be established in Scotland? According to the provisions of the Charter, the Council are empowered to examine "by themselves, or such competent persons as they should think fit to appoint." Consequently, the Board, if acting under the Charter, must be appointed by the Council. But it naturally occurred to the Committee that the selection of the Examiners ought to be vested in the Members in Scotland, and some objections prevailed respecting the jurisdiction of the Council. To meet this difficulty it was suggested that the Examiners should

be nominated by the Scotch Members at a meeting to be convened for that purpose, and that the names should be forwarded to the Council for approval and appointment. The Council could have no motive for objecting to the names thus recommended by those who, from personal and local knowledge, would be best qualified to form a correct judgment as to the fitness of the parties selected. Consequently, the selection would *practically* rest with the local Members, while the Council would make the appointment in conformity with the Charter.

As a means of promoting uniformity in the qualification and assimilating the two Boards, it was suggested that the number of Examiners should be the same in each, and that the President and Vice-President of the Society should be *ex officio* Members of both Boards. To this latter proposal it was objected, in the first instance, that the occasional visits of the *ex officio* Members might possibly interfere with the regular order of proceedings, and create confusion or misunderstanding. After some correspondence and discussion on this subject, it appeared to be the general opinion that this fear was groundless; that the attendance of the *ex officio* Members, which on account of the distance could not be very frequent, would tend to promote and keep up an amicable and consistent course of proceedings. Moreover, the laws of the Society do not restrict the election of President and Vice-President to London Members, and in case a Member resident in Scotland should be elected to fill either of these offices, he would be *ex officio* a Member of the Board of Examiners in London as well as of that in Edinburgh. There is no cause for jealousy or distrust between the two portions of the same kingdom. North Britain and South Britain are only separated by the Tweed, and the more closely the sympathies and interests of the respective inhabitants can be united, the more effectually will they strengthen and assist each other in carrying out an object which equally concerns them both.

By the arrangement above suggested the constitution of the two Boards would be precisely alike, both would be appointed by and under the jurisdiction of the Council, while the nomination of the Members of each Board would virtually be vested in the Members resident in the locality in which its functions would be performed. The reciprocal communication would ensure uniformity and consistency in the proceedings; at the same time the following bye-law of the Society would be equally applicable to both Boards:—

“The Board shall make such regulations from time to time as shall seem to them expedient for conducting the Examinations, which must be confirmed by the Council of the Society, and published in the Transactions; but the extent of knowledge and qualification required of all persons undergoing the Major and Minor Examinations, will be in the discretion of the Examiners for the time being.”

The relative position of the Council and the Board of Examiners in London has been found satisfactory. The proceedings of the Examiners are reported to the Council and duly confirmed. The Examiners report the names of candidates who have passed, the Council elect them as Members or Associates, as the case may be, and any change in the regulations is reported and confirmed in the same manner. There has been no collision or misunderstanding during the nine years that the Board has been in existence, and we see no reason to anticipate a less favourable result from the application of similar arrangements to a Board acting in Edinburgh.

On the supposition that the Board in Edinburgh is to be entirely independent, it would follow of necessity that the Society in Scotland must be a separate one. In that case the question arises, what advantage would be derived from the “repeal of the Union?” The Chemists in Scotland would have the work to begin *de novo*. Several years must elapse before they could expect to attain a position equal to that which the Pharmaceutical Society now enjoys, and this could only be acquired by dint of much labour and expense. This course, although suggested as an alternative, was not seriously entertained.

The above is a very brief outline of the substance of the discussion which took place at a meeting of the Committee in Edinburgh, on the 22d of Sept., and it was the unanimous opinion of all present, on taking a dispassionate review of the entire question, that it was highly desirable to maintain the unity of the Pharmaceutical Society—to assimilate the two examining Boards—and to lose no time in acting upon the suggestion of the Council. Resolutions to this effect were unanimously passed, and the honorary Secretary was authorized to transmit the same to the Council for approval. It was also resolved that communication should be made with the Chemists in the principal towns in Scotland for the purpose of inducing them to co-operate—by which means a considerable accession of Members is anticipated. About twenty who were in business before February, 1843, have already applied for admission, under the provision in the Charter relating to original Members, and several have given notice of their intention to come up for examination as soon as the Board of Examiners is appointed.

REMUNERATION FOR PROFESSIONAL SERVICES.

THE value of ordinary commodities finds its level by the reciprocal influence of supply and demand. The producer calculates the cost of production by a simple process of arithmetic, adding a percentage for profit, the amount of which is regulated by the balance of pressure between demand and competition.

The value of mental labour or professional skill is not deducible by any such method of calculation. The benefit conferred on the employer bears no *definite* relation to the expense incurred, or the labour bestowed, in each particular case; and although all these items may be considered as elements in the calculation, there is no formula by which to arrive at an uniform result. Consequently, disputes not unfrequently arise, and in the absence of a better tribunal, cases are argued in courts of law, and decided by juries, who, with every disposition to do justice, are in possession of imperfect data on which to form an opinion. As a general rule, professional men are underpaid for their services, because the nature of these services is not understood by those who have to form an estimate of their value; and however low this estimate may be, those parties who are called upon to pay the amount, are seldom satisfied. In the case of *Taylor versus Vickers*, reported in another part of this number (page 184), there are some peculiarities which seem to deserve notice.

The plaintiff's claim was for a certain number of analyses performed, and for consultations on the subject. The defendant admitted that he had given instructions for the performance of three analyses, but disputed the others. It was proved that the investigation had occupied the Professor and his assistant three or four days a week for upwards of six weeks—being not less than twenty days, and that the defendant had continually attended and given implied sanction to these proceedings, although not a written contract.

The plea put in by the defendant was a plausible one. It amounted to this, that in consequence of the difficulty of the case and the novelty of the question involved in it, some comparative experiments were necessary in order to enable the plaintiff to verify his analyses of the three samples sent for examination, and that by furnishing the materials for these comparative experiments, he (defendant) was rendering valuable assistance to the plaintiff in the performance of the task which he had undertaken. He did not expect to be charged for the analysis of samples which he had mixed himself, or of the several varieties of genuine isinglass and gelatine which he had furnished for the satisfaction of the plaintiff, who he contended was professionally interested in the success of the investigation. If he had merely sent his three samples for analysis, leaving the plaintiff to take his own course, the latter would have been obliged to provide the necessary materials at his own expense, and for want of authentic information as to the samples examined, he might have jeopardized his reputation by an

erroneous report. The experience gained in this case might be useful afterwards and lead to other commissions. There appears to be some weight in this argument. When a Chemist under ordinary circumstances undertakes to perform an analysis, his fee for the same includes all charges for skill, apparatus, and materials employed; and if he should require the assistance of his client in obtaining other materials to enable him to come to a conclusion, it does not follow that he is entitled to multiply analyses *ad libitum*, and to make a separate charge for each. If this were the case the laboratory of the Chemist might be transformed into a court of Chancery, in which a client might be led on to an extent which he never contemplated, in expenses quite disproportionate to the object in view. But in the present instance, the three analyses for which instructions were given formed only a part of the investigation. The object in view was the discovery of a simple method by which the adulteration might be detected and proved in a court of law. The capabilities of chemical science have certain limits, and throughout the investigation considerable doubts were entertained, whether this problem could be solved with that degree of precision which the rules of a court of law would require. But the defendant, desirous to leave no means untried, which by possibility could lead to a satisfactory result, continued his visits to the laboratory, attended by his solicitor, furnished samples, and thus, as the plaintiff considered, sanctioned a course of investigation which occupied not less than twenty days. The three original analyses, without the other experiments, would have been of no service. Although the result was negative, it furnished the defendant with information as to the facts of the case, and discouraged him from embarking in a lawsuit, in which he would probably have been defeated. The Professor sent in an account which astonished his client, and although we take exception on principle to the terms in which the items were specified, for reasons stated above, we think the amount a very moderate remuneration for the time occupied in the investigation. The question, however, hinges upon the precise nature of the instructions. A client cannot fairly be called upon to pay a Chemist the expenses of "getting up a subject" for the purpose of performing the required analysis.

For example, in a case of poisoning, a Chemist who had been in the frequent habit of performing analyses of that particular description, might, in half an hour, arrive at a result which would occupy another Chemist for several days. But if the client, on the first analysis proving unsatisfactory, should desire a further investigation to be made, in the hope of attaining the object in view, he could not reasonably expect the subsequent investigation to be included in the charge for the previous analysis. In difficult cases of this kind, a proper understanding ought to exist between the two parties, before the work is commenced.

The public have very little idea of the labour and research involved in chemical analysis. Patients frequently take a pill or a mixture to a Chemist's, requesting that the same may be analyzed, and a supply prepared, with a copy of the prescription, supposing that the price of the medicine will include the analysis. The following case occurred lately:—A patient having derived much benefit from a prescription, lent it to many of his friends, and acquired some celebrity as the possessor of a certain cure. One of his friends lost the prescription, but another happened to have a bottle of the medicine, which he obtained, and took it to a Chemist for analysis. Being informed that the expense would be two guineas, he said he could get a new prescription for half the money, which he accordingly did, by calling on the doctor.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

At a Meeting of the Council, held on the 3rd of September, the following Resolutions were adopted:—

A desire having been expressed by the Members of the Society in Scotland, that a Board of Examiners should be appointed to sit in Edinburgh, it was

Resolved, That the Council will be glad to receive and consider any proposition on this subject from the Members in Scotland; and that a copy of this Resolution be forwarded to the Local Secretary for Edinburgh.

A letter from Mr. Penney, addressed to the Council, having been read, it was *Resolved*, That Mr. Penney's letter be published in the Transactions of the Society.

34, Finsbury Circus, 2d 9 mo., 1851.

GENTLEMEN,—It has given me much pleasure to observe in the Pharmaceutical Journal for this month, that the Lectures of the Society are, during the coming session, to be free of all charge to the Associates, not that I think the principle of gratuitous instruction a good one, but as an evidence on the part of the Council of a desire to induce all connected with the Society to avail themselves of the advantages it offers. But, I would ask, is the expense of the lectures the only reason why they are so thinly attended? I think not, although, no doubt, amongst a class of young men but very moderately remunerated, it must necessarily influence them; yet a stronger reason influences, I believe, the greater number of Associates, viz., the difficulty of making such an arrangement with their employers as would enable them to attend, and this is increased when they reside at a distance from Bloomsbury Square. It is obvious when we consider the position of many now in the trade, that to be able to attend the lectures at all, they are entirely dependent on the generosity and good feeling of their employers, there being comparatively few who are able to give up a portion of their salaries, and perhaps none who could give up any of the very limited time at their own disposal, as a compensation for the time occupied in attending them. These observations are offered in a friendly spirit, to endeavour to show that the Associates of the Society, many of them, claim the sympathy of the Council.

During my residence in London, I have observed an increasing desire amongst Druggists' Assistants *generally*, to increase their knowledge of those subjects which would better qualify them for the duties they have to perform, and believe there are now many who would gladly attend the lectures if they only received a little encouragement from their employers, as there have been those who, with more energy than others, have successfully striven through every difficulty to do so.

I would, therefore, respectfully but earnestly suggest to you, whether you might not most effectually aid the cause of voluntary education amongst us, by issuing an Address, in your official capacity, to all the members of the Society resident in London, soliciting them to aid their Assistants and Apprentices, as far as it is in their power, in their endeavours to attend the lectures or otherwise avail themselves of its advantages. By so doing, I conceive you would best ensure our estimable and assiduous Professors a numerous attendance of diligent students, and procure for yourselves well deserved and enduring honour, and the respect and esteem of the Members and Associates of the Pharmaceutical Society.

I am, with much respect,

Yours sincerely,

To the Council of the Pharmaceutical Society.

WILLIAM PENNEY.

Resolved, That the Secretary deliver cards of admission to the several courses of Lectures, to Members, Associates, and Registered Apprentices, on application, free of charge: that Prizes be awarded, as before, at the close of the session, to Students who have taken tickets; but no Member be entitled to compete for any Prize.

In consequence of the death of Mr. Pigeon, one of the Trustees, it was *Resolved*, That Mr. R. H. PIGEON, the present Treasurer, be appointed Trustee of the Society.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE MINERAL WATERS OF BADEN-BADEN.

BY DR. SHERIDAN MUSPRATT, F.R.S.E., &c.

Professor of the College of Chemistry, Liverpool.

(*Read before the Royal Society of Edinburgh*).

BADEN is embosomed among hills, forming an offset of the Black Forest range, and seated on the banks of the Oos, an insignificant stream, which once, however, formed the boundary line between the Franks and Alemanni. It is famous for its beauty, but more so for its mineral springs, the most renowned in Germany, which were known to, and appreciated by the Romans, who fixed a colony in Baden, and called it *Civitas Aurelia Aquensis*. These springs are very much frequented, and their water is used internally and externally in all kinds of diseases, more especially for liver, mesenteric, and uterine complaints or obstructions: in fact, in 1845, nearly 40,000 persons resorted to them. The undoubted benefit derived from mineral waters in various diseases, attracted the attention of Chemists from a very early date, to the composition of medicinal springs. A great number, of analyses has been made of such waters, but most of them are imperfect, owing to the crude state of analytical chemistry when they were performed.

As yet, our speculations, regarding the part played by each constituent of mineral waters, are very vague, often in consequence of want of system in the arrangement of the various elements. So long as results are not tabulated according to some rule, it is impossible for the physician to institute a correct comparison, or to be able to judge upon which ingredient their effect mainly depends. There are thirteen thermal springs in Baden, which gush out of the rock at the foot of the Schneckengarten. A fine temple-like structure is erected over the Ursprung—principal spring—one of the hottest and most copious sources. The massive vault which encloses the spring is of Roman construction.

It is strange that there is no English work wherein an analysis of the waters of Baden-Baden is given. In order to have this deficiency remedied, I think it proper to furnish your Society with the analysis, which may prove interesting to others further pursuing the subject.

Qualitative Analysis of the Water.—The water as it flows from the Ursprung—principal spring—has a temperature of $67.5^{\circ}\text{C.} = 153.5^{\circ}\text{F.}$, the temperature of the surrounding air being 75°F. ; it is clear, and possesses a very faint animal odour, a trace of sulphide of hydrogen (P) and does not affect vegetal colour: it has a slight saline, or more properly speaking, a brothy taste.

The annexed experiments showed the several ingredients of the mineral water. When the water was boiled for some time a small white crystalline precipitate subsided. The qualitative analysis was, therefore, divided into two parts.

1st. The analysis of the crystalline precipitate.

2nd. The analysis of the substances in solution.

1st. The precipitate was treated with hydrochloric acid, which dissolved it all with effervescence, proving the presence of earthy carbonates and the absence

of *sulphate of lime*. A portion of the hydrochloric solution treated with sulphocyanide of potassium, gave a faint red colouring, indicative of iron. The precipitate did not contain any magnesia.

2nd. *Analysis of the Substances in Solution*.—A portion of the liquid filtered from the crystalline precipitate when evaporated to dryness did not effervesce with hydrochloric acid, proving the absence of alkaline carbonates.

A second portion of the liquid afforded on the addition of nitrate of baryta, a slight white precipitate, insoluble in hydrochloric acid, indicating sulphuric acid.

A third portion of the solution gave, with nitrate of silver, a copious white precipitate, easily soluble in ammonia, proving the presence of chlorides and the absence of iodides.

A fourth portion of the liquid was treated with hydrochloric acid, and evaporated to dryness over a naked lamp; on treating the residuary mass with water an insoluble part remained—silicic acid. A fifth portion of the liquid with the chloride of ammonium and oxalate of ammonia, gave a white precipitate of oxalate of lime. The filtrate from the oxalate of lime precipitate was divided into two portions; one gave slight indications of magnesia when treated with ammonia and phosphate of soda; and the other portion when evaporated to dryness, yielded a residue, which, when treated before the blow-pipe, coloured the flame intensely yellow, and gave, after being heated to redness with an alcoholic solution of bichloride of platinum, indications of potassa.

By separating the carbonate of lime and evaporating the filtrate nearly to dryness, cubes of chloride of sodium appeared in company with silky crystals of sulphate of lime formed by double decomposition. If the liquid be evaporated to dryness, the residue on exposure readily deliquesces, showing the presence of chloride of calcium. The substances present, and their respective amounts, in the imperial gallon, are the following:—

	Grains per Imperial Gallon.
Sulphuric acid	3.487
Chlorine	3.493
Silicic acid	94.064
Carbonic acid in combination with calcia	2.947
“ “ protoxide of iron	6.240
Sodium	0.514
Potassium	52.152
Calcium	7.182
Calcia (lime) insoluble	4.000
Magnesia	7.943
Protoxide of iron	1.749
Alumina, phosphate of lime, organic matter, &c. ...	0.842
	Mere traces
	181.120

Residue given by direct experiment 181.129

As the qualitative analysis proved the sulphuric acid not to be in combination with calcia (lime), the above bodies are hereafter tabulated in the exact state in which they exist in the water, thus:—

	Grains in the Imperial Gallon.
Chloride of sodium	132.644
Chloride of potassium	13.720
Chloride of calcium	11.040
Sulphate of magnesia	5.236
Carbonate of calcia (lime)	14.184
Silicic acid	2.947
Proto-carbonate of iron	1.356
Alumina, phosphate of lime, organic matter	Mere traces
	181.127
Specific gravity of the water	= 1.00284
Cubic inches of carbonic acid, per gallon	4.500

The only analysis I can find of the Baden-Baden water is by Kölreuter*. He gives the amount of each constituent in sixteen ounces of the water. I append his results calculated to the imperial gallon:—

Chloride of sodium	160.00
Chloride of magnesium	2.50
Chloride of calcium	17.50
Sulphate of lime	30.00
Carbonate of lime	16.60
Silica	3.30
Extractive matter.....	0.50
	230.40 (?)

His total amount of ingredients appears to be a great deal too much, moreover, he gives *sulphate of lime* as one of the constituents, and finds *no chloride of potassium*.

From the preceding analyses, it appears the principal ingredient is chloride of sodium, hence it belongs to the class of saline waters.

EXAMPLES OF INJUDICIOUS PRESCRIBING.

BY MR. HENRY CHARLES ANDREWS.

THE following remarks are made with a view of calling the attention of the medical profession to a few essential points which are often not duly considered while writing prescriptions. Some of the errors and contradictions are, doubtless, the result of inadvertence, which may have arisen from interruption by the patient, inquiries from the attendant, and other causes, which need not form part of this communication.

Therapeutical agents of great value are sometimes produced at the expense of decomposition, which at first may not seem desirable; it shows, therefore, a want of justice to criticise too severely the formula a practitioner may choose to adopt, but there are instances when an advantage of this kind is not gained; to such, then, my allusions will for the most part apply.

The prescriptions selected have been received to be dispensed, and in each case come under my own observation:—

R Liq. Ammon. Acet., ℥ij.
 Sp. Ammon. Arom., ℥j.
 Sp. Æther. Nit., ℥j.
 Acid. Sulph. Dilut., ℥ij. Mft. guttæ.

In this mixture there is a solution of ammonia with sulphuric acid, a combination which could afford but little relief in any variety of disease.

R Ext. Taraxaci, ℥ij.
 Sp. Ammon. Arom., ℥iv.
 Inf. Rosæ Co., ℥vss.
 Sodæ Carb., ℥ij. Mft. Mist.

The above objection may here again be urged, while the variation of colour obtained by the manipulation of different individuals, might create serious apprehension of an error being committed.

R Magnes. Sulph., ℥j.
 Antim. Pot. Tart., gr. j.
 Inf. Rosæ Co., ℥vj. Misce.

We now have emetic tartar with an acid and the astringent matter of rose-leaves; a decomposition of the salt necessarily follows, and its efficacy is, to a great extent, impaired.

* Simons' *Heilquellen Europa's*, Berlin, 1839, p. 22.

R Unguent Hydrarg., ℞j.

Aloes, Barbado., ℞iiss.

Sodæ Carb., ℞j. Mft. ope Sp. Nitri dulcis massa, in pil. xxiv. dividend.

This formula is peculiar in two respects. An interview with the medical gentleman was not practicable, as he resided at a distance. Under the circumstances Pil. Hydrarg. was employed, but more recent prescriptions have been sent in which the ointment has been persisted in, so the deviation would, perhaps, not have been sanctioned. If this form of mercury is considered eligible for internal use, it would be better to leave the choice of an excipient to the dispenser.

R Acid Tannic, gr. xxiv.

Infus. Cuspariæ, ℥vij.

Syr. Mori, ℥ss.

Tinct. Aurant., ℥iij.

Zingib., ℥i.

Opil, ℥xviiij fl. Mist.

Inf. Cuspariæ cannot be considered a good vehicle for the administration of tannin, tannate of cusparin being formed, and an inelegant appearance given to the medicine.

R Morphis Acet., gr. iss.

Tinct. Scillæ, ℥j.

Syr. Tolut., ℥iij.

Sodæ Biboracis, ℥ss.

Mist. Acaciæ, ℥j. M.

On adding borax in the above proportion, the gum is instantly precipitated and the whole mixture reduced to a condition unfit for the purpose intended.

29, Chapel Street—September 4, 1851.

ON THE EXISTENCE OF SUGAR IN THE URINE OF A HORSE.

BY DR. X. LANDERER,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmaciaen to the King of Greece, &c.

DIABETES is a very rare disease among horses. The animals which are affected with this disorder pass much more urine than they do in a state of health, and even more than the quantity of water which they drink. The urine is almost colourless, as clear as water, and throws down no precipitate. It has not the usual characteristic odour. The animal loses flesh from day to day, his appetite fails, and he wastes away. Having observed that this disease very much resembles diabetes in the human subject, I subjected the urine of a horse thus affected to chemical investigation. The specific gravity was 1.048. By evaporation I obtained a thick syrupy mass. With yeast it commenced to ferment briskly, and disengaged carbonic acid. The other re-agents used for the detection of sugar, namely, sulphuric acid, chromic acid, the method of Heller with caustic potash, &c., convinced me of the presence of sugar, and I am sure that the malady of this horse was a true diabetes mellitus.

ANALYSIS OF THE LIVER OF A HORSE SUFFERING FROM STEAROSE.

BY DR. X. LANDERER,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmaciaen to the King of Greece, &c.

In a horse wasted with pneumonia, the section of the liver was found in a state very rarely observed in these animals. The organ had a dark yellow colour, a hard consistence, and could be cut like cheese in slices. These slices felt between the fingers like adipocere, resembling the matter which is formed by the action of water on muscles. They also produced on silk a grease spot. By heating this liver grease was also evolved of a dark brown colour, and

rancid odour quite different from the grease of a healthy organ. Portions of the liver, when dried and ignited, burned like a candle, giving out a very black smoke, and an odour like that of Ozokerite or fossil wax. By repeated maceration of this organ with sulphuric ether, the grease was dissolved leaving the fibrine, and after the evaporation of the ether I obtained a sufficient quantity of grease for chemical examination. This grease appeared like a combination of oxide of lipyl (the assumed base of fixed oils) with a particular acid. When boiled with caustic potash it was converted into a soapy mass, which, by decomposition by acids, disengaged a very penetrating and rancid odour. By cold digestion with ether a small quantity of cholesterin was dissolved, which, by evaporation, separated in crystals. The disease of this animal resembled stearose.

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(Continued from page 114.)

FROM BRITISH GUIANA.

(A.) MINERAL KINGDOM.

SUBSTANCES USED IN THE MANUFACTURE OF GLASS, POTTERY, AND EARTHENWARE.

1. **WHITE SAND.**—From Mount Pleasant, Waratilla Creek, River Demerary, contributed by T. M. Pollard. This sand has been exported to the United States of America, for the purpose of glass-making.

2. **RED SAND.**—From Waratilla Creek, River Demerary, contributed by T. M. Pollard.

3. **WHITE SAND.**—From Monte Video, River Berbice, about 200 miles above its estuary, contributed by T. B. Duggin.

4. **OREALA.**—A decomposed rock, supposed to be valuable in the manufacture of pottery. From the River Berbice, contributed by T. B. Duggin.

5. **CLAYS and SAND.**—Obtained at various depths from an Artesian boring. Contributed by J. F. Bee. This boring, four inches in diameter and 118 feet in depth, on Plantation Woodlands, one mile from the mouth of the Mahaica River, was executed between 6th and 22d October, 1849, by Mr. John Allt. The water (much impregnated with iron) is delivered eighteen inches above the surface of the soil, and is greatly increased in quantity by the flood of spring tides, like all other Artesian borings in the colony. The following memorandum was taken during the process of boring:—1 to 5 feet, surface soil; 6 feet, layer of caddy; 7 to 9 feet blue clay; 9 to 39 feet soft mud mixed with caddy, in which the auger went down by its own weight; 39 to 53 feet, rotten wood and pegass, or decayed vegetable matter; 53 to 55 feet, bluish grey clay, stiff; 55 to 57 feet, clay a little red and grey; 57 to 70 feet, reddish clay; 70 to 82 feet 10 inches, yellowish grey clay, with a little sand and ochre, very stiff; 82 feet 10 inches to 86 feet 8 inches, bluish grey clay streaked; 86 feet 8 inches to 92 feet, bluish grey clay, streaked, more yellow. The bed of sand from which the water is obtained, was reached at a depth of 118 feet, and the same stratum was found at a depth of 125 feet. The numbers on the 31 specimens sent, indicate the depth in feet at which they were obtained.

(B.) VEGETABLE KINGDOM.

1. SUBSTANCES USED CHIEFLY AS FOOD, OR IN ITS PREPARATION.

6. **RICE.** (*Oryza sativa*, Lin.)—From Pltn. Klein Pouderoeyen, River Demerary, contributed by A. D. Vander Gon Netscher.

7. **RICE.**—From Monte Video, River Berbice, contributed by T. B. Duggin. The colony of British Guiana is eminently favourable for the cultivation of rice. It is worthy of remark, that three crops can be obtained annually in this colony from one sowing, the new crop ratooning or springing up from the old roots after each reaping.

8. **MAIZE, or INDIAN CORN.** (*Zea Mays*, Lin.)—From Pltn. Klein Pouderoeyen, River Demerary, contributed by A. D. Vander Gon Netscher. The maize grown in British Guiana commands a higher price in the market than that imported from the United States of America, from which the chief supply is derived.

9. **MEAL FROM MAIZE or INDIAN CORN.**—From Pltn. Klein Pouderoeyen, River Demerary, contributed by A. D. Vander Gon Netscher.

10. **PLANTAINS.** (*Musa paradisiaca*, Lin.)—Unripe, sliced, and dried without the

aid of fire. From Pltn. Klein Pouderoen, River Demerary, contributed by A. D. Vander Gon Netscher.

11. **PLANTAIN MEAL, OR CONQUIN TAY.**—From Pltn. Klein Pouderoen, River Demerary, contributed by A. D. Vander Gon Netscher.

12. **PLANTAIN MEAL.**—From Pltn. Vigilance, East sea-coast Demerary, contributed by Wm. Davidson.

13. **PLANTAIN MEAL.**—From Pltn. Herstellng, River Demerary, contributed by H. T. Garnett.—Dr. Shier gives the following account of plantain meal: "Plantain meal is prepared by stripping off the husk of the plantain, slicing the core and drying it in the sun. When thoroughly dry it is powdered and sifted. It is known among the creoles of the colony under the name of Conquin tay. It has a fragrant odour, acquired in drying, somewhat resembling fresh hay or tea. It is largely employed as the food of infants and invalids. As food for children and convalescents, it would probably be much esteemed in Europe, and it deserves a trial on account of its fragrance, and its being exceedingly easy of digestion. In respect of nutritiveness, it deserves a preference over all the pure starches on account of the proteine compounds it contains. The plantain meal would probably be best and freshest were the sliced and dried plantain cores exported, leaving the grinding and sifting to be done in Europe. The flavour of the meal depends a good deal on the rapidity with which the slices are dried; hence the operation is only fitted for dry weather, unless indeed, when there was occasion for it, recourse were had to a kiln or stove. Above all, the plantain must not be allowed to approach too closely to yellowness or ripeness, otherwise it becomes impossible to dry it. The colour of the meal is injured when steel knives are used in husking or slicing; but silver or nickel blades do not injure the colour. On the large scale a machine, on the principle of the turnip-slicing machine, would be employed. The husking could also be greatly facilitated by a very simple machine. Were the plantain meal to come into use in England, and bear a price in any way approaching to that of Bermuda arrowroot, it would become an extensive and very profitable export. Full-sized and well-filled bunches give 60 per cent. of core to 40 of husk and top-stem, but in general it would be found that the core did not much exceed 50 per cent., and the fresh core will yield 40 per cent. of dry meal, so that from 20 to 25 per cent. of meal is obtained from the plantain; or 5 lbs. from an average bunch of 25 lbs.; and an acre of plantain walk of average quality, producing during the year 450 such bunches, would yield a ton and 10 lbs. of meal, which at the price of arrowroot, namely 1s. per lb., would be a gross return of £112 10s. per acre. A new plantain walk would give twice as much. Even supposing the meal not to command over half the price of arrowroot, it would still form an excellent outlet for plantains whenever from any cause the price in the colony sank unusually low. Specimens have been transmitted from the Colonial Laboratory to some of the principal authorities on dietetics in England."

14. **MEAL, from the BITTER CASSAVA (*Janipha Manihot*, H. B.).**—Baked into bread.—From Pltn. Herstellng. River Demerary, contributed by H. T. Garnett. The following is taken from the Report of Dr. Shier, above referred to, p. 15:—"It may soon become an important question whether the plantain or some of the edible roots grown in the tropics, might not be sent to Europe in a fresh state as a substitute for the potato. Many of them, the buck yam and the cassava for instance, ought to be used when fresh dug, for every day they are out of the ground they deteriorate. This, however, is not so much the case with some of the larger yams. It is worth trying whether the finer sorts that deteriorate by keeping might not, after being sliced and dried in the sun, become articles of export either in that state or when ground to meal. For this purpose the bitter cassava, the plantain, and the buck-yam are the most promising. Of the bitter cassava mention has already been made as a substance from which starch and *casareep* might be prepared. In this case, however, the woody and cellular tissue, with the small quantity of starch left in it by the ordinary starch process, would form far too poor an article of diet to constitute part of the food of man. But the roots might be used as an article from which to prepare cassava meal, *casareep*, and the very small quantity of starch which is expressed along with the juice, leaving all the rest of the starch to form part of the meal. It is of such meal that the cassava cakes of the Indians are prepared, and although by no means so nutritive as Indian corn-meal, there can be little doubt that in the Scotch and Irish markets the cassava-meal would obtain a preference, and were it exported in quantity it would probably come into extensive use among all classes. The process would be as follows:—After washing in a revolving apparatus, by which means the adherent earth would be got quit of, and almost the whole of the thin dark coloured cuticle would become detached, the roots

would be reduced to pulp in a rasping-mill without the use of water; the pulp would be compressed in bags by hydraulic pressure, whereby the juice, together with a small portion of the starch, would be expressed. After allowing the starch to subside, the juice would be concentrated to about the density of 1.4. The starch would be washed, purified, and dried. The contents of the bags would then be broken up and dried in the sun or in a current of air, after which the meal would be sifted through a coarse sieve to separate the coarser parts, which, if their amount was considerable, could be ground and added to the rest. In this state of rough meal it is fit for making the cassava cakes. If ground to flour it might be used to mix with wheat, rye, or barley flour. If an acre of well-tilled thorough-drained land yield 10 tons of fresh roots, and I have every reason to believe that such a return might be obtained, I have ascertained that the produce would be $3\frac{1}{2}$ tons of meal, 593 lbs. of casareep, and 2 cwt. of starch; and estimating the meal at 1d. per lb. the casareep at 1s. 5d. per lb., and the starch at 40s. per cwt., the gross amount would be £78 13s. 4d. per acre. In ascertaining these proportions, very simple machinery was employed, and had the pulp been better pressed, the casareep would have been considerably greater."

15, 15a, 15b. BANANAS. (*Musa sapientum*, Lin.)—Dried without the aid of fire. From Pltn. Vigilance, East sea-coast, Demerary, contributed by J. de Putron. These specimens are sent in order to ascertain the likelihood of their standing the voyage, and becoming an article of export. They were prepared in the month of September, 1850. The following information regarding the banana is extracted from the *Library of Entertaining Knowledge*, volume, Timber, Trees, Fruits, page 366 :—"Eight or nine months after the sucker has been planted, the banana begins to form its clusters, and the fruit may be collected in the tenth or eleventh months. When the stock is cut, the fruit of which has ripened, a sprout is put forth, which again bears fruit in three months. The whole labour of cultivation which is required for a plantation of bananas, is to cut the stalks laden with the ripe fruit, and to give the plants a slight nourishment once or twice a year by digging round the roots. A spot of a little more than a thousand square feet will contain from thirty to forty banana plants. A cluster of bananas produced on a single plant often contains from one hundred and sixty to one hundred and eighty fruits, and weighs from seventy to eighty pounds. But reckoning the weight of a cluster only at forty pounds, such a plantation would produce more than four thousand pounds of nutritive substance. Humboldt calculates that as thirty-three pounds of wheat and ninety-nine pounds of potatoes require the same space as that in which four thousand pounds of bananas are grown, the produce of bananas is consequently to that of wheat as 133 to 1, and to that of potatoes as 44 to 1. The banana ripened in the hot-houses of Europe has an insipid taste, but yet the natives of both Indies, to many millions of whom it supplies their principal food, eat it with avidity, and are satisfied with the nourishment it affords. This fruit is a very sugary substance; and in warm countries, the natives find such food not only satisfying for the moment, but permanently nutritive. Yet weight for weight, the nutritive matter cannot at all be compared with that of wheat or even of potatoes. At the same time, a much greater number of individuals may be supported upon the produce of a piece of ground planted with bananas, compared with a piece of the same size in Europe growing wheat. Humboldt estimates the proportion as twenty-five to one; and he illustrates the fact by remarking that a European newly arrived in the torrid zone, is struck with nothing so much as the extreme smallness of the spots under cultivation round a cabin which contains a numerous family of Indians." It may be proper here to notice that the banana is cultivated in this colony to a very limited extent, and used solely as a fruit in its ripe state. The plantain, on the other hand, is extensively cultivated, and in its unripe state, is the staple and favourite food of the Creole and African population of the colony.

16. COFFEE. (*Coffea Arabica*, Lin.)—From Pltn. Klein Pouderoyen, River Demerary, contributed by A. D. Vander Gon Netscher.

16a. PEARL COFFEE.—From Pltn. Nooit Gedacht, Canal No. 1, River Demerary, contributed by John Kennedy.

16b. PEARL COFFEE.—From Pltn. Nooit Gedacht, Canal No. 1, River Demerary, contributed by John Kennedy.

17. COFFEE, in the husk. From Georgetown, Demerary, contributed by J. F. Bee.

18. COFFEE.—From Georgetown, Demerary, contributed by J. F. Bee. The quantity of coffee the produce of British Guiana, returned for taxation in 1842 amounted to 1,214,010 lbs. Dutch. The cultivation is now almost extinct. Nos. 16a and 16b

are from one of the few estates which have been and still continue to be cultivated solely as Coffee Plantations.

19. CACAO, OR COCOA SEEDS.—From Pln. Klein Ponderoyen, River Demerary, contributed by A. D. Vander Gon Netscher. Cacao, or cocoa (*Theobroma Cacao*, Lin.), was never extensively cultivated in this colony, although the soil and climate are well adapted for its production.

20. SAOUARI NUTS.—From River Berbice, contributed by T. B. Duggin. Saouari Nuts (*Pekia tuberculosa*, Aubl., or *Caryocar tomentosum*, Dec.) The kernel of this nut is one of the most delicious fruits of the nut kind known. It abounds in the forests on the banks of the rivers of the colony.

20a. MONKEY POT, SEED-VESSEL OF.—From River Demerary, contributed by J. Outridge. This very singular seed-vessel is the Pericarp of *Lecythis grandiflora*, Aubl. It contains a great number of oleaginous kernels, larger than almonds, which are much esteemed by the Indians. The operculum has unfortunately been disfigured by the removal of its pointed apex, and by having been slightly grooved in attempting to secure it by a cord to the pericarp.

21. CAPSICUMS, DRIED CAPSULES OF.—From Pln. Kitty, east sea-coast, Demerary, contributed by David Shier. These capsicums, known in the colony under the name of Buckramanni Peppers, are the most pungent and aromatic of the whole tribe. The seeds which are inert, have been removed, and the dried capsules are sent in the expectation of their being found to be a more piquant condiment than the article sold under the name of Cayenne Pepper.

22. CAPSICUMS, preserved in dilute acetic acid.—From Pln. Kitty, east sea-coast, Demerary, contributed by David Shier.

22a. CAPSICUMS, preserved in dilute acetic acid.—From Pln. Kitty, east sea-coast, Demerary, contributed by David Shier.

22b. CAPSICUMS, known as Yellow Bonnet Peppers, preserved in dilute acetic acid.—From Pln. Kitty, east sea-coast Demerary, contributed by David Shier.

22c. CAPSICUMS, known as Yellow Bonnet Peppers, another specimen of the same.

23. CAPSICUMS, Active principle of, extracted by olive oil.—From Pln. Kitty, east sea-coast Demerary, contributed by David Shier.

24. CAPSICUMS, Active principle of, extracted by vinegar.—From Pln. Kitty, east sea-coast Demerary, contributed by David Shier.

25. CAPSICUMS, preserved in dilute acetic acid.—From Georgetown, Demerary, contributed by J. S. Stutchbury.

26. BIRAMEL, FRUIT OF A SHRUB CALLED. Preserved in pickle.—From the River Berbice, contributed by T. B. Duggin. The fruit of this shrub makes a pickle and a delicious preserve.

27. LIMES (*Citrus Lima*, Macfadyen.) Preserved in pickle.—From Pltn. Klein Ponderoyen, contributed by A. D. Vander Gon Netscher.

28. KASAREEP.—The inspissated juice of the bitter cassava. From Georgetown, Demerary, contributed by J. S. Stutchbury.

29. KASAREEP. The inspissated juice of the Bitter Cassava (*Janipha Manihot*, H.B.)—From Georgetown, Demerary, contributed by J. F. Bee. Kasareep is much used as the basis of sauces, and is used extensively in the Colony in the preparation of pepper-pot, &c. Dr. Shier, in his report above referred to, notices it as follows, p. 12: "To those who have never visited the tropics, it may be proper to notice that *casareep* is the concentrated juice of the roots of bitter casava, and the basis of the West Indian dish pepper-pot. One of its most remarkable properties is its high antiseptic power, preserving any meat that may be boiled in it for a much longer period than can be done by any other culinary process. *Casareep* was originally a Buck or Indian preparation, and has often be described with more or less accuracy." It is well known that some of the Dutch Planters of this Colony have, by means of the addition of a small quantity of *casareep*, from time to time, to varieties of animal food, been enabled to keep up, in daily use, the same pepper-pot for many years.

29a. SALINE ASH. Used by the Indians as a substitute for salt.—From River Demerary, contributed by J. Outridge. This ash is obtained by burning certain plants growing on the rocks near the rapids, about 100 miles up the River Demerary. The salt is extracted when required by mixing water with the ash, and after the insoluble parts have subsided, pouring off the solution, and using it as salt. A similar saline ash is also said to be obtained by burning the Ita Palm.

30. TURMERIC ROOT. Preserved in dilute acetic acid.—From Georgetown, Demerary, contributed by J. S. Stutchbury. The turmeric (*Curcuma longa*, Lin.) grown in this colony is superior to any imported.

31. **ARROWROOT.**—From Pltn. Herstelling, River Demerary, contributed by H. T. Garnett. The produce of *Maranta arundinacea*, Lin.

32. **STARCH.** From the Bitter Cassava.—From Pltn. Herstelling, River Demerary, contributed by H. T. Garnett.

33. **STARCH.** From the Sweet Cassava (*Jasipha Loeftingii*, H. B.)—From Pltn. Kitty, east sea-coast Demerary, contributed by David Shier.

34. **STARCH.** From the Plantain (*Musa paradisiaca*, Lin.)—From Pltn. Kitty, east sea-coast, Demerary, contributed by David Shier.

35. **STARCH.** From Buck Yam (*Dioscorea triphylla*, Lin.)—From Plantation Kitty, east sea coast, Demerary, contributed by David Shier. Persons desirous of obtaining further information regarding the starches of this Colony, and of their applicability to manufacturing and other purposes, are referred to the tabular results, contained in the Report of Dr. Shier, on the Starch-producing plants of the Colony, above referred to, pp. 4 to 12. (See *Pharm. Journ.* vol. vii., pp. 193 to 199.)

36. **SUGAR, VACUUM PAN.**—From Plantation Ogle, east sea-coast, Demerary, contributed by George Anderson and Co. This sugar was manufactured as follows: The cane juice was clarified by lime, and the coagulum separated by subsidence, by means of clay. The evaporation was conducted in the ordinary way, and finished in the vacuum pan. The sugar was washed by means of Inniss's process.

37. **SUGAR, VACUUM PAN.**—From Plantation Hope, east sea-coast, Demerary, contributed by John Jones. This sugar was washed by means of Inniss' process.

38. **SUGAR, VACUUM PAN.**—From Plantation Hope, east sea-coast, Demerary, contributed by John Jones. This sugar was cleaned by means of Hardman and Finzel's patent centrifugal machine.

39. **SUGAR, VACUUM PAN.**—From Plantation Enmore, east sea-coast, Demerary, contributed by J. S. Stutchbury. In the manufacture of this sugar, the syrup was passed through animal charcoal before being put into the vacuum pan.

40. **SUGAR.**—From Plantation Friends, River Berbice, contributed by James Laing. Manufactured in Gadsden and Evans's pan. This sugar on being removed from the pan was put into cones, and after the molasses was drained off, was syrumped.

41. **SUGAR, MUSCOVADO.**—From the colonial laboratory Georgetown, Demerary, contributed by David Shier. This Muscovado was made according to the plan recommended by Dr. Shier. Lime in slight excess was used in clarification. The coagulum was got rid of by subsidence. The excess of lime was neutralized and the juice was concentrated on the open fire. No washing or syrumping had recourse to.

42. **MOLASSES.**—From the colonial laboratory, Georgetown, Demerary, contributed by David Shier. This specimen of molasses is from the Muscovado sugar, marked No. 41.

43. **SUGAR MUSCOVADO.**—From the colonial laboratory, Georgetown, Demerary, contributed by David Shier. This Muscovado was made by a modification of Melsen's process. No washing or syrumping was used.

44. **MOLASSES.**—From the colonial laboratory, Georgetown, Demerary, contributed by David Shier. This specimen of molasses is from the Muscovado sugar marked No. 43.

45. **SUGAR MUSCOVADO.**—From Plantation *Fellowship*, Mahaicony, east sea-coast, Demerary, contributed by J. S. Stutchbury. Manufactured by the ordinary process in use on estates in this colony.

Note.—All of the above mentioned sugars are the produce of the Otaheite, or Tahiti cane (*Saccharum officinarum*, Lin.) the variety universally cultivated in this colony.

2. MATERIALS USED CHIEFLY IN THE CHEMICAL ARTS, OR IN MEDICINE.

46. **COPAIBA, BALSAM OF.**—From River Pomeroon, Essequibo, contributed by J. S. Stutchbury. There are several trees in this colony supposed to yield the balsam, not yet botanically determined.

47. **CAOUTCHOUC.**—From River Demerary, near the Falls, contributed by J. Outridge. Taken from the India rubber tree by tapping, and formed into balls by the Indians, who climb the tree, and as the gum exudes, rub it on their bodies till it assumes a sufficient consistency to be formed into balls.

48. **MILK FROM THE COW TREE.**—From River Demerary, contributed by J. Outridge. This fluid appears to contain caoutchouc. It is supposed to be obtained from *Tabernaemontana utilis*, Arnot, or a species of *Brosimum*.

49. **GUM RESIN.** From the Simiri or Locust tree.—From River Berbice, contributed by T. B. Duggin. This gum is obtained by digging in the vicinity of the

roots of the tree (*Hymenaea Courbaril*, Lin.) from which it exudes in a vertical direction in columns or pieces upwards of a foot in length. It may also be obtained by tapping the tree, when in the course of a few days a large solid mass is formed. It is said to be the gum anime of commerce, and is occasionally used in this colony for the same purposes as gum copal. It may be obtained in great abundance in various parts of the colony.

50. KARMAN.—From River Essequibo, contributed by G. R. Bonyun. Used by the Indians for waxing their nets and other purposes, and is said to be the inspissated juice of a tree called the Man, or Mannee Tree.

51. HYAWA GUM, or INCENSE.—From River Demerary, contributed by J. Outridge. This gum is very fragrant, and is supposed to be suitable for pastiles and similar purposes. It is said to be obtained from the *Icica heptaphylla*, Aubl.

52. LAUREL OIL.—From River Pomeroon, Essequibo, contributed by J. S. Stutchbury. This oil, supposed to be obtained from *Oreodaphne opifera*, Nees., is extensively used by the natives in affections of the joints. It is also an admirable solvent of India-rubber.

53. CRAB OIL.—From River Essequibo, contributed by J. S. Stutchbury. This oil is obtained from the seeds of the tree yielding crabwood, *Xylocarpus carapa*, Spr., or *Carapa Guianensis*, Aubl. It is used in the colony for burning, and is highly esteemed as a hair oil.

54. DART OF DALI TREE, SEEDS OF (*Viola sebifera*, Aubl.)—From River Berbice, contributed by T. B. Duggin. Candles are made from these seeds, said to be equal to wax. The tree abounds throughout the colony.

55. SAND BOX TREE, SEEDS OF.—Georgetown, Demerary, contributed by David Shier. The seeds of *Hura crepitans*, Lin. They are a drastic purgative, and contain a very limpid oil.

55a. LANA TREE, FRUIT OF.—From River Berbice, contributed by H. A. Koch. This fruit is the produce of *Genipa Americana*, Lin., a tree very abundant in the colony, and produces the Lana dye.

55b. LANA DYE.—From River Berbice, contributed by H. A. Koch. This dye is the juice of the fruit of the *Genipa Americana*, Lin. The colour produced is a beautiful bluish black. The Indians use it in staining their faces and persons, and the effect lasts for several days.

55c. INDIAN PAINT.—From River Demerary, contributed by J. Outridge. This pigment is prepared by mixing arnotto, the red viscous pulp surrounding the seeds of the *Bixa Orellana*, Lin., with crab oil, the produce of the seed of *Carapa Guianensis*, Aubl. It is used by the Indians for decorating their persons and other purposes.

56. MORA TREE, BARK OF.—From River Berbice, contributed by T. B. Duggin. Bark of *Mora excelsa*, Benth.; used as a tanning substance, and very plentiful.

57. HOG PLUM TREE, BARK OF.—From River Berbice, contributed by T. B. Duggin. Bark of *Spondias lutea*, Lin.; used as a tanning substance, and very abundant.

58. COURIDA TREE, BARK OF.—From Pltn. Kitty, east sea-coast, Demerary, contributed by David Shier. Bark of *Avicennia nitida*, Lin.; used as a tanning substance, and extremely abundant on the sea-coast.

59. HY-ARI OR HAT-ARI.—Fish poison. From River Demerary, contributed by J. S. Stutchbury. Stem of *Lonchocarpus nicou*, Dec.; used by the natives to intoxicate fish for the purpose of capturing them.

59a. YARRIMARA, FRUIT OF.—From River Berbice, contributed by H. A. Koch. This is stated by the contributor, Dr. Koch, to be the fruit of a vine found in the interior of the colony, and which he claims the merit of having discovered to be the chief ingredient of the celebrated Wourali poison.

60. ANGOSTURA BARK.—From River Pomeroon, Essequibo, contributed by J. S. Stutchbury. Supposed to be obtained from *Galipea cusparia*, St. Hil., or *G. officinalis*, Hanc. Used as a febrifuge.

61. RHIZOPHORA, or MANGROVE BARK.—From east sea-coast, Demerary, contributed by J. S. Stutchbury. Bark of *Rhizophora racemosa*, Meyer; ascertained to be a very valuable remedy in cases of chylous urine.

62. TRYSLB BARK.—River Demerary, contributed by J. Outridge. Used as an emetic by the Indians.

63. GREENHEART TREE, BARK OF.—From River Demerary, contributed by J. S. Stutchbury. Bark of *Nectandra Rodiaei*, Benth. Yields the alkaloid known as bibirine, a febrifuge.

64. GREENHEART TREE, SEEDS OF.—From River Berbice, contributed by T. B. Duggin. Used as a tonic and febrifuge. Occasionally, in times of scarcity, these

seeds are grated and mixed with decayed wallaba (the wood of *Eperua falcata*, Aubl.) and used by the Indians as food.

65. GUINEA PEPPER, or GRAINS OF PARADISE.—From River Demerary, contributed by J. S. Stutchbury. Seeds of *Anomum Melegueta*, Rosc. These seeds are much superior to those imported from Africa.

66. ALPINIA or SHELL PLANT, SEEDS OF.—From River Demerary, contributed by J. S. Stutchbury. These seeds (*Alpinia nutans*, Rosc.) resemble, and in some respects possess, the properties of cardamoms.

67. PHYSIC NUTS, SEEDS OF.—Georgetown, Demerary, contributed by David Shier.

68. PHYSIC NUTS, SEEDS OF.—Georgetown, Demerary, contributed by E. A. Manget. These physic nuts are the produce of different trees, but are possessed of similar emetic and purgative properties, and are frequently used as a domestic medicine by the black population of the colony.

69. QUASSIA BITTER.—From Pln. Zeelandia, Wakenaam, river Essequibo, contributed by Mrs. Arrindell. This is the produce of *Quassia amara*, Lin. It is distinct from the quassia of the shops, and is extensively and successfully used in the colony as a tonic and febrifuge. It is very abundant.

70. BOELARI, BUSH ROPE.—From River Demerary, contributed by J. S. Stutchbury. This bush rope is plentiful in the interior of the colony, and is a favourite remedy of the Indians in pectoral complaints. It is exceedingly aromatic, and forms an excellent ingredient in stomachic bitters.

(C.) ANIMAL KINGDOM.

123. ISINGLASS.—From the Gilbagre, or Gilbacker. Contributed by Morison and Knox. This is the sound of the *Silurus* — ? a fish very abundant in the estuaries of the rivers of this Colony.

124. HONEY.—From Pltn. Woodlands, River Mahaica, contributed by J. F. Bee. This is the produce of a small wild bee, which is stingless, and easily domesticated. The honey is deposited in small separate pouches, and may be removed once every month by making a puncture in the bottom of the pouch, from which it readily flows—which opening the insect afterwards speedily closes up.

MANUFACTURES, &c.

133. MATAPI, OR CASSAVA SQUEEZER.—Made of the Ita Palm, contributed by David Shier. Used by the Indians for expressing the juice from grated cassava. Before being filled it is compressed as far as possible so as to increase its diameter; it is then filled and suspended from a beam, and a lever is inserted into the lower loop, to the long end of which a weight is applied, by which the Matapi becomes elongated. It will be observed that the change of form in the vessel will tend to diminish its cubic contents, and when stretched to its utmost length, its capacity will be diminished by nearly one-third: hence its applicability for effecting expression.

134. ETAMI, OR CASSAVA SIFTER. —Used by the Indians. Made of the Ita Palm, contributed by J. F. Bee.

146. WINNA.—Used by the Indians for enclosing tobacco, in the form of sheroots, for smoking; and said to be made of the rind of the fruit of the manicole palm, *Areca Manicot*, Lodd. From River Berbice, contributed by T. B. Duggin.

148 b. ADADA, OR WOOD-SKIN.—From the River Demerary, contributed by J. OUTRIDGE. This is the bark of the purple heart-tree, called by the Indians *Mariwayana*. Sir R. Schomburck says—"They take off the bark of this tree when fresh cut down, and, with very little trouble, convert it into a canoe, commonly called a 'wood-skin'; some of which are large enough to carry 20 to 25 persons with perfect safety on smooth water." During the month of February of the present year, the contributor and two other persons, weighing together not less than 500 lbs., descended, or "shot," the rapids, about 100 miles above the estuary of the River Demerary, in this wood-skin, in perfect safety. The seats commonly made use of in wood-skins consist of two or more light cylindrical pieces of wood, the ends of which are notched and rest upon the gunwale. The wood-skin sent measures 18½ feet in length, and about 28 inches in width. Accompanying it are two paddles made of yaruri, or paddle-wood.

(To be continued.)

ON THE MANCHINEEL TREE (*Hippomane Mancinella*, Linn.)

BY M. BERTHOLD SEEMANN, NATURALIST OF H.M.S. HERALD.

It is said of the *Manzanillo de playa* that persons have died from sleeping beneath its shade; and that its milky juice raises blisters on the skin, which are difficult to heal. The first of these statements must be regarded as fabulous, and the second be received with a degree of modification. Some people will bear the juice upon the surface of the body without being in the least affected by it; while others experience the utmost pain: the difference seeming to depend entirely upon the state of a man's constitution. Great caution, however, is required in protecting the eyes, for if the least drop enters them, loss of sight and the most acute smarting for several days are the consequence. The smoke arising from the wood produces a similar effect; and I remember that, while surveying on the coast of Darien, a whole boat's crew of H.M.S. Herald was blinded from having kindled a fire with the branches of this tree. Whenever the natives are affected by the poison they at once wash the injured part in salt water. This remedy is most efficacious, and, as the *Manzanillo* is always confined to the edge of the ocean, of easy application. It has been stated that the Indians of the Isthmus dip their arrows in the juice of the *Manzanillo*. There are, however, various reasons for doubting this assertion; firstly, because the poison is, like that of all *Euphorbiaceæ*, extremely volatile, and, however virulent when first procured, soon loses its power; secondly, because its effect, even when fresh, is by no means so strong as to cause the death of human beings, it not even producing, as has already been stated, the slightest injury on some constitutions. We may, therefore, consider the statement as an inaccuracy, and rather suppose that the Indians, like those of Guayana, obtain their poison from the *Strychnos toxifera*, Bth., and *S. cogens*, Bth., two plants very common throughout Panamá and Darien.—*Hooker's Journal of Botany*, September, 1851.

ABYSSINIAN REMEDIES FOR THE CURE OF TAPE-WORM.

BY DR. T. W. C. MARTIUS.

In the *Jahrbuch für praktische Pharmacie* for June last, Dr. Martius has given notice of no less than seventeen Abyssinian remedies.

1. **RADIX ADANDASCH.** Atantash. Attantasch. *Euphorbia depauperata*, Hochst. Fam. Euphorbiaceæ.—The plant grows at a height of from 7000 to 10,000 feet above the level of the sea. The dose is an inch of the root (about 57 grains). It acts as a very active purgative. In very large doses, it is dangerous, and is said to have proved fatal.

2. **RADIX MOKMOKO.** *Rumex Abyssinicus*, Jacq. Fam. Polygonæ.—The specimen in Dr. Martius's possession is the root-bark of the above plant. The dose is twenty-one grains in powder. As this quantity is small, it is to be presumed that the remedy is active, although the different species of *Rumex* are usually very mild in their operation.

In South Abyssinia, *Rumex arifolius* bears the name of *Mekmoko*.

3. **RADIX OGKERT.** Radix Sar-Sari. Ogkert in the Amhara language; Sar-Sari in the Tigre language. *Silene macrosolen*, Koch. Fam. Caryophyllæ.—Grows at a height of from 7000 to 9000 feet above the sea. The root is much used as an anthelmintic on the other side of the Taccazes in the Amhara country, less so in Tigre. The dose is one inch and a half of the root. The original dose which I received, consisted of three thin pieces, weighing three drachms forty grains. It is probable, therefore, they were from a young plant.

4. **RADIX SCHEBTI.** Schebti in the Tigre language. Andot in the Amhara language. Endot in South Abyssinia. *Phytolacca decandria*, l'Herit. Fam. Rhamnaceæ.—This remedy appears to me to be the most interesting of the whole group. It is a mild emetic and laxative. Dose 41 grains.

5. **RADIX TERNACHA.** *Verbascum Ternacha*, Hochst. Fam. Scrophularinæ.—The bruised fruits stupify and kill fish, and are used as a bait by fishermen. The root acts as a laxative. Dose 70 grains.

6. **RADIX TSCHOKKO.** Radix Habbe Tschokko. Habba Dchoggo. Medjamedjo. Mitschamitscho in the Amhara language, Habadjago in the Tigre language. *Oxalis anthelmintica*. Al. Braun. Fam. Oxalidæ.—The dose of the bulbs is 15 drachms. According to Pruner, this drug is preferred to kosso. It does not purge, but kills the worm, which is expelled in two or three days. Schimper says the bulbs are

taken in the form of powder in the morning, fasting. The effect is increased by fermenting the drug with beer, which is to be drank in the morning. The bulk of the drug requisite to be taken as a dose is a drawback to its use.

7. CORTEX MUSENNA. Cortex Mussena. Cortex Busenna. Cortex Abussenna. Musena in the Amhara language; Busena in the Tigre language. Chumado in Shoa.—Dr. Martius cannot give any information respecting the origin of this bark. The celebrated Pruner-Bey observes, that until 1848, he had employed kosso (cosso or couosso) in hundreds of cases, and with good success; but about this time his friend d'Abbadie returned from Gondar to Cairo with his Abyssinian teacher, and the latter brought with him a bagful of the young bark of the tree Musenna (Masenna) and advised him to try it against the tape-worm, asserting at the same time, that it excelled by far the kosso. The Abyssinians take the kosso, as is well known, several times in the year, because they seldom or never succeed in removing the head and head-joints of the parasite. The learned gentleman who was afflicted with the evil, was ready to have the remedy tried on himself. Two ounces of the bark were therefore powdered, mixed with chopped meat, which was formed into small boluses, and slightly roasted. Having eaten the evening before only some rice, the patient took them the next morning, without eating anything the whole day, except again some rice towards evening. The following day, the worm was expelled in several pieces, but somewhat softened and infiltrated. During the last two years, Pruner-Bey has employed this remedy in nineteen individuals of various descents, and found it infallible; the worm did not always come off at once, but often successively in single pieces. The musenna differs from kosso in the circumstance, that the first kills the parasite without purging.

Schimper considers that the mother-plant of the bark belongs to Leguminosæ; but Professor Mettenheimer gave Buchner a bark which he called *Cortex Brayera*, and which appeared to agree with the musenna bark. Gastinel, a Chemist at Cairo, declares that musenna bark contains a peculiar alkaloid.

The dose of this remedy is seven drachms. It is given in the form of powder made into an electuary. It is said not to purge, but to kill the worm.

8. CORTEX TAMBUCH, *Rottlera Schimper*. Hochst. and Steudel. Fam. Euphorbiaceæ.—Grows from 5000 to 7000 feet above the level of the sea. Dose 18 grains. It is said to cause nausea, vomiting, and purging.

9. FOLIA AULE. Aulé in Tigre language, Wolra in the Amhara language. *Olea chrysophylla*. Fam. Oleaceæ.—The original dose weighs one ounce, two drachms, and two scruples. The leaves are sometimes given by themselves as a purgative anthelmintic, but as they easily cause vomiting, it is usual to add a few of them to kosso.

10. HERBA HABBE ZELLIM. *Jasminum floribundum*, R. Brown. Fam. Jasmineæ.—The leaves are a dangerous purgative. They are given in powder with kosso against tape-worm, but are said to cause much pain and even death. My original dose weighed one ounce and half a drachm; but Buchner says the dose is a small handful. Schimper states that the remedy is given in beer.

11. HERBA HAFALU, Haffafalu in the Tigre language, Aregressa in the Amhara language. *Bryonia scrobiculata*, Hochst. Fam. Cucurbitaceæ.—The powdered leaves are soothing and sedative. I have not received an original dose.

12. HERBA HANDUKDUCK. *Euphorbia*? Fam. Euphorbiaceæ.—Dose 13 grains.

13. HERBA MADDERE. Herba Matterei. Anfar in the Amhara language. *Buddleia polystachya*. Fam. Scrophulariæ.—Dose 13 grains. The young leaves are purgative, and are mixed with kosso.

14. FLORES COSO.—Coso, cuso, couosso, cosso, kosso, kuso, koso, kousso, kwoso, gosso, cotz or cabotz. *Brayera anthelmintica*, Kunth. *Brayera vermifuga*, De Cand. *Hagenia Abyssinica*, Willd. *Banksia Abyssinica*, Lamark. Fam. Rosacæ.—For details respecting this Abyssinian remedy see Dr. Pereira's paper in the *Pharmaceutical Journal*, vol. x., p. 15.

15. FLORES ET HERBA BELBILDA.—Belbida. Bolbida. *Celosia Adoënsis*, Hochst. et Steudel. Fam. Amaranthaceæ.—All the upper parts of the plant act as a violent purgative anthelmintic. The leaves, flowers, and fruits are powdered and taken in beer. This remedy is much in use. The dose is half an ounce.

16. CAPSULE SAORIA.—*Moesa picta*, Hochst. Fam. Myrsinæ. According to Schimper the powdered ripe fruit is taken mixed with water. It is the least unpleasant of all the before-mentioned remedies. It acts as a purgative, and expels the worm entire. It does not affect the general health, and is much recommended by Schimper to the notice of European physicians. The dose is one ounce and one drachm and a half. It is also given in conjunction with kosso.

17. CAPSULE SCHEBTI.—Schipte, septe, schebti, in the Tigre language, Andot in

the Amhara language. *Phytolacca dodecandra*, l'Herit. *Phytolacca Abyssinica*, Hoff. The dose is seven fruits, which weigh about $8\frac{1}{4}$ grains. The smallness of the dose is a great convenience. The dried fruits are used by the natives as a kind of soap for washing cotton garments.

CUCUMIS ABYSSINICA AS A REMEDY FOR RABIES.

M. RENAULT, of Alfort, has experimented on five dogs suffering under rabies, and has not found any influence to have been exerted upon the disease by this root, which has been introduced by M. d'Hericourt, from Abyssinia, where it is said to be used successfully as a certain cure for rabies.—*Lond. Med. Gazette*, Sept. 12, 1851.

ON THE TESTS FOR CINCHONA BARKS.

BY DR. A. BUCHNER, SEN.

THE varieties of spurious and genuine cinchona barks are so numerous that the most practised eye cannot determine the value of a bark from its external characters. As to the names of the various sorts they are of little use. Of much greater importance, however, is the proportion of the alkaloid which the bark contains, and, as in quinine manufactories, this chemical test determines, in doubtful cases, the purchases, so every Pharmaceutist ought to ascertain, in the same way, and as exactly as possible, the value and efficacy of the bark which he keeps in his dispensary; not for the purpose of determining the species or subspecies, but rather the relative proportion, i.e., the per centage of the alkaloids contained in the bark. Wöhler's *cinchona bark test* effects the object completely, but with some loss of time. It is applied as follows:—Half an ounce of powdered bark is boiled with a proper quantity of boiling water, acidulated with a scruple of muriatic acid; the acid decoction is filtered and the residue washed with hot water. The decoction is then evaporated to dryness and the extract re-dissolved in water, mixed with a few drops of muriatic acid. The red cinchonic remains insoluble. The filtered muriatic solution of the alkaloid is now to be precipitated with caustic ammonia, and the precipitate dried and weighed. Whether the alkaloid consists of quinine, cinchotin, or cinchonine, or whether it be a mixture of two or of the three of these can be determined by ether, since quinine as well as cinchotin are soluble in this liquid, whilst cinchonine remains undissolved.

Cases may, however, occur where it would be important to perform this test in as short a time as possible; and, indeed, the operation would be much more simplified and shortened, if it could be ascertained whether the colouring matter, which is precipitated by ammonia, is but of small proportions, or, in the principal sorts of barks, contained in approximately similar proportions, in which case it might be left entirely unnoticed. With this view and with the intention of discovering some simple and expeditious test, I made the following experiments:—

I. *Cortex Chinae Regius*.—*Yellow or Calisaya Bark*.—Two ounces of a beautiful coated sort, and distinguished by all the characteristics of genuineness, were coarsely powdered and treated with eight ounces of water, acidulated with one scruple of officinal diluted sulphuric acid for twenty hours, at a temperature of from 50° to 60° R. It was repeatedly stirred and then filtered. The liquid was perfectly clear, like pale yellow wine, of a pleasant aromatic odour and acidulous bitter taste. The residue was twice more digested at the above temperature, each time from twenty to twenty-four hours, with from eight to nine ounces of water and a few drops of diluted sulphuric acid, until the liquid became only slightly clouded by ammonia. All these infusions having been mixed together, the alkaloid was precipitated by ammonia, without previous evaporation, until an alkaline reaction took place, and no more turbidity was produced by the addition of ammonia to the liquid filtered off for a trial from the precipitate. The quinine was then collected on the filter, washed, pressed, and dried. In a moist state it possessed a chocolate-brown colour; after drying its colour was very deep red-brown, and weighed twenty-one grains; 100 parts of yellow bark contained, accordingly, 2.187 parts of coloured quinine. The filtered liquid had a beautiful red colour, but no attempt was made to obtain the quinine contained in it. This process may be much abbreviated if one ounce of cinchona powder be boiled for half an hour with twelve ounces of water and half a scruple of diluted sulphuric acid, the residual powder exhausted by about four ounces of hot water and the filtered liquid directly precipitated by ammonia or car-

bonate of soda. It is not advisable to treat the precipitate with hot water, because both the quinine and the cinchotine are rather too readily dissolved by water.* I employ, therefore, only a small quantity of cold water for this purpose, and press the precipitate between several sheets of blotting-paper, whereupon the evaporation in the water-bath is performed in a short time, so that the whole operation may be finished within an hour and a half or two hours.

The 2.187 grains of quinine obtained from 100 grains of yellow bark, correspond pretty nearly with the result obtained by Winckler,† according to whom sixteen ounces of yellow bark contained 164 grains of quinine. The uncoated bark may even, in favourable cases, yield three per cent. or even more of quinine. The alkaloid that I obtained was, after drying, of a deep red-brown colour, consequently combined with a considerable proportion of colouring matter. In order, therefore, to determine approximatively the per centage of pure quinine in this coloured precipitate, the following experiment was made:—Eighteen grains of this coloured quinine were rubbed down with nine grains of acetate of lead, then digested with about six or seven drachms of water for ten hours and frequently shaken, during which time the cinchona colouring matter appears to have perfectly combined with the oxide of lead, for the supernatant solution of the acetate of quinine, when poured off from the brown sediment, was perfectly clear and without colour. In order to remove every trace of oxide of lead from the solution, and to dissolve at the same time every particle of alkaloid, I added very cautiously to this mixture a few drops of diluted sulphuric acid, until a sample of it, filtered, had a strong acid reaction, and appeared free of lead upon the addition of sulphuretted hydrogen. (Excess of sulphuric acid must be carefully avoided, as by it colouring matter is again redissolved.) The solution of acid sulphate of quinine thus obtained had a pale wine-yellow colour, and it is very likely that this last trace of colouring matter could also have been removed by the application of bone charcoal, had I not feared to occasion by the latter a loss of the alkaloid. The quinine, precipitated by carbonate of soda, was white in a moist state, but when dry it assumed a pale Isabella yellow colour, and the proportion of colouring matter deserved no consideration; but I was astonished to find the weight of the quinine to be, after washing with cold water, pressing, and drying, only 2.7 grains, which amounts to fifteen per cent. of the coloured alkaloid. The removed liquid, which contained principally sulphate and carbonate of soda, had retained a portion of the quinine, and tasted, therefore, saline bitter. In order to determine also this portion quantitatively the salt was evaporated to dryness, treated with highly rectified spirit of wine, and the tincture shaken with its own volume of ether in order to obtain the sulphate of quinine free from the other salts. The filtered ethereal liquid, evaporated to dryness, left behind 1.3 grains of light yellow coloured alkaloid, which showed the characteristics of quinine; dissolved in chlorine water and tested with ammonia, it yielded the well known grass-green product. It is, therefore, obvious that by this method, only four grains of perfectly pure quinine were obtained from eighteen grains of the coloured alkaloid, or 4.7 grains only from twenty-one grains, so that the bark employed for this experiment would only contain one-half per cent., or, more correctly, 0.486 grains of quinine in 100.000 grains of yellow bark, which is decidedly too little.

In order to see whether the brown combination of cinchona colouring matter with oxide of lead was devoid of alkaloid, it was digested at a proper temperature with alcohol of 90°, the tincture filtered and evaporated. The residue consisted of a brownish-yellow resin, from which a very insignificant proportion of alkaloid was extracted by diluted sulphuric acid.

The unfavourable result of these experiments depends probably on the very great solubility of the quinine in watery liquids, and in order to be able to determine the proportion of the alkaloid approximatively, it appears absolutely necessary to concentrate, according to Wöhler's directions, the acid extract of the bark as much as possible, or to evaporate it to dryness.

II. *Cortex China Fuscus*—*Brown Cinchona Bark*.—A brown bark, consisting of quills not thicker than the finger, known in commerce by the name of *Huanuco*, apparently in a perfectly good condition, was treated exactly as No. I.

The alkaloid obtained by precipitation with ammonia had, when moist, a brownish-yellow or ochre-colour; after drying it became deep yellowish-brown, and weighed 18 grains, equal to 1.875 grains coloured alkaloid in 100 grains of brown bark.

* One part of quinine is supposed to dissolve in 100 parts of boiling water.

† *Repert. f. de Pharm.*, 2 Reihe xxv., p. 828.

Winckler obtained from 16 ounces of Huanuco bark 190 grains of cinchonine, equal to 2.473 grains in 100 grains.

The ammoniacal solution filtered from the alkaloid was not red, but similar to brown beer. The different results at this stage of the operation are very decisive in cases where it is to be determined whether powdered cinchona bark is prepared from calisaya or from humalies bark. The acid infusion of calisaya (yellow bark) is coloured red by ammonia, and precipitated of a chocolate-brown colour (considering the precipitate in a moist state), whilst the acid infusion of the brown cinchona is coloured yellowish-brown by ammonia, and precipitated of an ochre-colour.

For the purpose of purifying the coloured alkaloid, sixteen grains of it were rubbed down with eight grains of sugar of lead, gradually mixed with six drachms of water, and allowed to stand during ten hours, frequently shaking the mixture. The result was a perfectly clear and colourless solution of acetate of quinine, the colouring matter and the oxide of lead remaining behind as an insoluble combination. Diluted sulphuric acid was now employed, in order to dissolve every particle of the alkaloid, and the liquid was not deprived of any proportion of lead. The cinchonine precipitated from the sulphuric solution by carbonate of soda, had a pale sulphur-yellow colour, and weighed, after pressing and drying, 8.2 grains. From 100 grains of brown cinchonine were then obtained 51.3 grains of almost pure alkaloid, which would be equal to 0.958 grains of alkaloid in 100 grains of brown bark; and this result is much more in accordance with those obtained in operations on a large scale, than that obtained in No. I.; for it is a well known fact, that there are sorts of brown bark which are sold sometimes as loxa bark, sometimes as crown bark, and sometimes as Huanuco bark, and which seldom yield half per cent. of pure cinchonine, and sometimes even less. It is very probable that the lower degree of solubility, which the cinchonine possesses, was the cause of this more favourable result; for one part of cinchonine requires 3000 parts of boiling water for its solution; so that, if one ounce of bark be treated with from eight to ten ounces of water, with ten to fifteen grains of diluted sulphuric acid, and this decoction precipitated by ammonia or carbonate of soda, the cold liquid, filtered from the coloured alkaloid, will contain but little more cinchonine. The cause of this better result is in part also the nature of the colouring matter, of which by far a smaller proportion is precipitated by ammonia from the extract of brown bark than from that of yellow bark.

Although cinchonine is soluble in water only in a slight degree, still its solubility as well as that of the cinchotin is much increased by the co-operation of certain salts, which is also the case with quinine. The following fact may prove this assertion: the solution of the generated sulphate and carbonate of soda, removed from the 8.2 grains of cinchonine, amounted hardly to one ounce, and yet it contained 2.3 grains of the alkaloid in solution, which I obtained by treating the salt, evaporated to dryness with absolute alcohol. That this portion of the alkaloid, which possessed after the evaporation of the alcohol a yellowish-white colour, was not quinine, but very likely cinchotine, was shown by its solubility in ether and by the test with chlorine water and ammonia, by which the sulphuric solution of the alkaloid was not in the least coloured green. The following experiment appears to prove that this alkaloid, which readily dissolves in absolute alcohol, in acetic acid, in diluted sulphuric acid, and possesses in these solutions a pure bitter taste, is a combination with soda; heated before the blow-pipe or platinum it became carbonized, and was burnt with an evolution of that balsamic odour, which accompanies the cinchona alkaloids during their carbonization; at the same time the jet from the blow-pipe became yellow, and at last a small quantity of fused soda was found on the platinum. Sulphuric and carbonic acids were not contained in this compound of the alkaloid. We must, therefore, admit as certain, that the cinchona alkaloids actually form with soda a combination readily soluble in water, or that the solubility of the soda in absolute alcohol rests upon the decomposition of a part of the latter and the generation of acetic or formic acid. If we add the 2.3 grains of cinchonine, or rather of cinchotin, that had been retained by the solution of sulphate and carbonate of soda to the first obtained 8.2 grains, we have 10.5 grains of the alkaloid, or 1.23 grains of cinchonine to the originally employed brown bark.

III. *Cortex China Huamalis*—*Huamalis Cinchona*.—The characteristics of this bark are warty protuberances and longitudinal furrows on the epidermis, with a rusty-brown colour. The pieces employed for examination consisted of quills and semi-quills of the thickness of the finger. They were coarsely powdered and treated with unacidulated water at a temperature of 50° to 60° R. The filtered liquid was clear, of a wine-yellow colour, but darker than that of No. I., and possessed a tannic

odour like No. II. The alkaloid obtained by ammonia was in a moist condition, yellowish-brown or like ochre; when dry its colour was blackish-brown, like that of the Huanuco bark; two ounces of Huamalis bark had yielded fifteen grains. The filtered ammoniacal liquid had a beautiful red colour, like that of yellow bark.

Thirteen grains of the coloured alkaloid rubbed down with 6.5 grains of sugar of lead, and digested during twelve hours with six drachms of water, yielded also a colourless solution of alkaloid acetate; but upon adding, for the purpose of removing the oxide of lead, rather too much sulphuric acid, the liquid became yellow like wine, and the alkaloid precipitated with carbonate of soda was brownish-grey; the latter weighed 2.3 grains. The filtered solution of the generated sulphate of soda having been evaporated to dryness and treated with absolute alcohol, yielded still three grains light yellow alkaloid. The whole quantity amounted, therefore, to 5.3 grains, equal to 6.11 grains alkaloid to two ounces Huamalis bark, equal to 0.63 per cent. Winckler had obtained from sixteen ounces of the best Huamalis bark eighty-nine grains, consequently 1.15 per cent. alkaloid, cinchonine, and quinine. Quinine I could not discover, for the alkaloid being dissolved in diluted sulphuric acid and then tested with chlorine water and with ammonia, showed no green colour; the liquid remained colourless; there is, therefore, besides cinchonine also cinchotine present, which was obtained in fine prisms after dissolving the alkaloid in ether and evaporating the latter.

IV. *Cortex Chinae Flavus—Carthagens Bark.*—The yellow bark from Carthagens belongs to the cheapest sorts, and is often sold as yellow or calisaya bark. Although it may easily be distinguished from it, I examined it with the intention of seeing whether it yields alkaloid, and how much in proportion to calisaya bark, and whether it contains also quinine. The colour of the sulphuric extract was the same as in No. I., but its taste was rather tannic. The precipitate obtained with ammonia was reddish-brown when moist, and after drying, reddish-black-brown, like in No. I.; the filtered ammoniacal liquid had an intense wine-yellow colour, one of the distinguishing characteristics of calisaya and Carthagens barks. Two ounces of powder yielded 12.7 grains coloured alkaloid, equal to 1.32 per cent. The Carthagens bark belongs, as it appears from this, to those sorts which possess the largest proportion of alkaloid; the alkaloid, however, is not quinine, but for the greatest part cinchotine. In diluted sulphuric acid it dissolved with a wine-yellow colour, leaving behind a yellow-brown colouring matter; and this solution mixed with chlorine water and afterwards with ammonia yielded at first a grey-brown substance, and only later a white alkaloid settled down from the filtered ammoniacal solution, which formed with sulphuric acid a combination of a bitter taste, and consisted very probably of cinchotine.

V. *Cortex Chinae Regius, perceptibly adulterated with Chinae Nova Surinamensis—Calisaya Bark, adulterated with Surinam Bark.*—The adulteration was in this case distinctly proved by testing, for the infusion prepared with water, acidulated with sulphuric acid, was not pale-wine-yellow, but yellowish-brown, similar to brown beer, of a rather mucilaginous consistency, and formed an abundant froth when shaken. The odour of cinchonine was but slight. The rather abundant precipitate produced by ammonia was of yellowish-brown colour, and subsided but slowly, on account of its mucilaginous nature. Two ounces of bark yielded 9.5 grains, equal to 0.98 per cent., which is considerably less than No. I. The alkaloid proved, nevertheless, to be quinine, for a solution of it in chlorine water yielded with ammonia a grass-green product.

VI. *Chinae Nova Surinamensis—Surinam Bark.*—This spurious bark, which can be obtained at a very low price, is generally employed for adulterating the better sorts, especially the calisaya bark and Carthagens bark. The decoction of this bark has a brown colour, and at the same time its cinchonine smell is weaker, and its taste more astringent than with the decoction of all genuine barks. The decoction prepared with water acidulated with sulphuric acid was of a reddish-brown colour, which became still more intense by adding ammonia until an alkaline reaction took place. It was not turbid; but after a few hours a slight turbidness appeared, but no precipitate. This corroborated the long maintained assertion, that this Surinam bark contains no alkaloid, but only kinova bitter with cinchona-tannic acid.

VII. *Chinae Nova Brasiliensis—Brazilian New Cinchona Bark.*—I once more convinced myself that this red solid and heavy bark contains no alkaloid, and is to be considered as spurious. The acidulated extract was blood-red, without cinchona smell, and of a weaker acid-bitter taste than the extracts of other barks. Ammonia produced only after several hours turbidness, without any precipitate. The purely

aqueous decoction poured off whilst hot, was clear, almost blood-red, of an astringent bitter taste, and but slightly clouded after cooling.

Conclusions.—1. The bark-test proposed by me answers fully the intended purpose; it is easily performed, and is decisive in cases where the question is whether a certain powder of calisaya bark has been prepared of calisaya, brown, Carthagena, or of some spurious bark; for the extract of calisaya bark prepared with hot water, which has been acidulated with sulphuric acid, has a pale wine-yellow colour, a peculiar aromatic odour, and when treated with an excess of ammonia, yields an abundant reddish-brown precipitate, the liquid itself assuming a beautiful red colour, whilst brown cinchona yields a brownish-yellow or ochre-coloured precipitate, the liquid retaining a yellowish-brown colour. The acid infusion of Carthagena bark is certainly also pale wine-yellow, and is precipitated by ammonia of a chocolate colour, like that of calisaya bark, but the ammoniacal liquid when filtered is not red, but dark wine-yellow. Huamalies bark treated in the same way yields a dark wine-yellow infusion, of a less aromatic flavour than that of calisaya bark; and treated with ammonia, the precipitate is ochre-brown, like that of the brown Huanuco bark (*China fusca*), but the ammoniacal liquid is not yellowish-brown but red, almost similar to that of calisaya bark. The spurious sorts furnish with pure water much darker extracts than the genuine barks; they possess, moreover, a more astringent taste, and when treated with ammonia until an alkaline reaction takes place, yield no alkaloid.

2. The test proposed by me can be performed within a few hours, if the bark be finely powdered, if the acidulated water be employed boiling, and if the precipitate produced be evaporated in the vapour-bath. Certainly under these circumstances no very exact result, with regard to the proportions of the alkaloid, can be expected.

3. If the latter be intended the acid decoction must be concentrated by evaporation as much as possible, and the alkaline liquids, filtered from the alkaloids, must be evaporated to dryness in order to extract every trace of quinine and cinchotine.

4. The alkaloids precipitated by ammonia or carbonate of soda from the acid decoctions, are always combined with a humus-kind of cinchona colouring matter, which is of another character and of different proportions in the calisaya and other barks, and can easily be separated from the alkaloid by acetate of lead.

5. It may be taken as a rule that one ounce of calisaya bark, treated with twelve ounces of water and half a scruple of diluted sulphuric acid, when treated with ammonia, will not yield less than ten grains, or two per cent. of coloured quinine.

6. The brown or Huanuco bark (*Ch. fusca*), treated in the same manner, yields only 8.9 grains, or one per cent., and even less. It contains, besides the cinchonine, some other alkaloid, which is soluble both in the soda liquid and in ether, and which is not quinine but very likely cinchotine.

7. The rust-coloured Huamalies bark contained in one ounce 7.5 grains or 1.54 per cent. of coloured alkaloid, a very large proportion, which gives it, very likely, a greater medicinal value, but I could not detect in it any quinine; for ammonia produced no green colour in the chlorine solution of the same. It appears, therefore, that Huamalies bark as well the Huanuco bark, contain, besides cinchonine, also cinchotine.

8. The Carthagena bark contained in one ounce 6.35 grains coloured alkaloid, equal to 1.32 per cent.; it differs however much from calisaya bark, both by its external characteristics and by the absence of quinine; the alkaloid appears to consist chiefly of cinchotine. Notwithstanding this difference, however, it may well be ranked among the better sorts, on account of its large proportion of alkaloid.

9. The spurious Surinam and Brazilian barks are easily distinguished from the genuine sorts by their external characteristics. Moreover, their acidulated infusions have not a pale wine-yellow colour, but are reddish-brown or brownish-red, and ammonia or carbonate of soda produces no precipitate. They are, therefore, of no greater pharmacological value than our willow-trees, chestnuts, &c.—*Buchner's Repert.*, 3th Reih, Bd. viii., Heft 2, p. 145, 1851.

REMARKS UPON THE CINCHONA PITAYA, OR PITAYA BARK.

BY MR. B. W. BULL.

SOME years since, a sample of bark came under the observation of the writer, which corresponds in its physical characteristics with the description of a bark under the head of False Cinchonas, in the United States *Dispensatory*, under the above name.

Dr. Pereira, in his *Materia Medica*, and Guibourt mention the same bark under slightly different names, and all agree in attributing to it the so-called alkaloid *Pitaya*, said to have been discovered by two Italian Chemists, Folchi and Peretti. The parcel alluded to was purchased by a drug-house, in Boston, eight or ten years since, from the mate in a whaling-vessel; no information was obtained by them respecting the locality of South America whence it was procured; but it may be inferred that it came from the north-west coast, since ports in that region are said to be the only ones which the whalers frequent.

It is apparently taken from the younger branches of the tree, is closely quilled, the quills are about twenty-four inches in length; in diameter, from three-eighths to one inch, and about an eighth-inch in thickness; it is compact, and destitute of the fibrous structure observable in the true cinchonas.

The colour of the outer surface is a dull brown, interspersed with irregular patches, which are of a lighter tint than the surrounding portions; in some specimens possessing a citron or yellowish brown, and in others a grey colour. These spots vary in length from one-quarter of an inch to six inches; and in breadth, from a quarter-inch to the whole surface of the quill. Those of the citron colour seem to be slightly depressed, as if a part of the exterior coat had been removed, but a close examination shows this not to be the case. The grey spots are not as sharply defined, and appear to be caused by the presence of cryptogamous plants. The inner surface varies from a light to a dark brown, and is in some specimens nearly black. The transverse fracture is irregular, has a deep orange colour, and a disagreeable permanently bitter taste, very different from the aromatic bitter of the true cinchona.

At that time I instituted a series of experiments, with a view of isolating this alkaloid, as well as for the purpose of ascertaining as far as possible the other constituents. I was entirely unsuccessful in detecting any alkaline principle, and the result of my observations were, that, beside ligneous fibre, its principal constituents are, resin, gum in small proportion, a sweetish substance, red colouring matter, a green colouring substance soluble in ether; a volatile principle to which the odour of the bark is due, and inorganic lime salts, consisting mainly of chloride and sulphate, to which may be added a bitter principle, soluble in water and alcohol, which may be classed with the long list of analogous substances under the head of Bitter Extractive.

It is unnecessary to go into detail in relation to the processes used to arrive at the above results, but it may be added, that this bark, subjected to treatment with aqueous or alcoholic menstrua, manifests properties widely differing from those of the official cinchonas under similar circumstances.

The above-mentioned extractive matter resembled very much in tenacious property, as well as in taste, the extract of gentian, while several different processes were unsuccessful in enabling me to separate from it any crystallizable principle.

A specimen of this bark was shown by me to Professor Guibourt, at the Ecole de Pharmacie, in Paris, which he pronounced at once to be the variety from which the above-mentioned alkaloid was said to have been obtained, but that its discovery by Folchi and Peretti was a *betise*. Professor G. seemed to be of the opinion that this bark contained either quina or cinchonia, though I did not understand that he had investigated it himself. Since that time I have re-examined a portion of this same bark at the laboratory in Giessen, and am quite confident that it contains no alkaline principle whatever, and its tonic properties, if it possesses any, must be traced to other sources than to the presence of the principles which have hitherto been attributed to it.—*N. Y. Reg. of Med. and Phar.*, Feb. 15, 1850.

[There are two entirely different barks, to both of which the name of *Pitaya bark* has been given. One of these is the *quinquina bicolore* of Guibourt, and is the produce of *Stenostomum acutatum*, De Cand. The other cinchona bark, to which M. Guibourt assigns the name of *quinquina pitaya*, is the produce of Columbia, somewhat resembles Calisaya bark, and is probably the produce of *Cinchona academica*.—*Ed. Pharm. Journ.*]

ON THE SIPHONIA, OR INDIA-RUBBER TREE.

BY RICHARD SPRUCE, ESQ.

THE Seringue-tree has long been known to exist abundantly on the Rio Madeira, but it is only during the present year that it has been found to grow on the Ramos in considerable quantity.

After breakfast the Capitão accompanied us into the forest, and showed us the

Seringue-trees, and the mode of collecting the milk. A track had been cut to each tree, as also to adjacent flats of Urucurí palm (*Cocos coronata*, Mart.), which, curiously enough, is almost invariably found along with the Seringue, and whose fruit is considered essential to the proper preparation of India-rubber. A stout sipó is wound round the trunk of the Seringue, beginning at the base and extending upwards about as high as a man can reach, and making in this space two or three turns. This sipó supports a narrow channel made of clay, down which the milk flows as it issues from the wounded trunk, and is received into a small cúa deposited at the base. Early in the morning a man goes into the forest and visits in succession every tree, taking with him a terçado and a large cúa (called *cuyamboca*) suspended by a handle so as to form a sort of pail. With his terçado he makes sundry slight gasheas in the bark of each tree, and returning to the same in about the space of an hour he finds a quantity of milk in the cúa at the base, which he transfers to his cuyamboca. The milk being collected and placed in a large shallow earthenware-pan, several large caraipé-pots, with narrow mouths, are nearly filled with the fruit of the Urucurí and placed on brisk fires. The smoke arising from the heated Urucurí is very dense, and as each successive coat is applied to the mould (which is done by pouring the milk over it, and not by dipping it into the milk), the operator holds it in the smoke, which hardens the milk in a few moments. The moulds now used are all of wood, and not of clay as formerly, and the one generally preferred is in the form of the battledores which English housewives use for folding linen, only thinner and flat on both sides, and the milk is applied only as far as to the insertion of the handle, the latter being held by the operator. When the requisite number of coatings has been applied, and time has been allowed for the whole to stiffen, the seringue is withdrawn from the mould by slitting it along one side and end. In this state it is known in the Pará market as *Seringue em couro*, or hides of India-rubber, and it is preferred to the bottle-rubber by purchasers. I send you one such "hide," from which you will see that Capitaó Pedro's manufacture is not despicable. If the bottle-moulds are used, or if a shoe is to be moulded on a last, a stick of two feet long is always inserted into the mould to guarantee the operator's hand from the milk and smoke. Some shoes we saw here had thirty coatings apiece of seringue. The Capitaó was getting about six milreis an arroba (32 lbs.) for his seringue, but in Pará it sells for as much as ten milreis. November is the season of ripe fruit of the Seringue, but the trees on the Ramos had been completely stripped by the aráras, a sort of long-tailed parrot.—*Hooker's Journal of Botany*, September, 1851.

ON THE DATURA SANGUINEA.

BY M. BERTHOLD SEEMANN, NATURALIST OF H.M.S. HERALD.

THE *Florispondio* (*Datura sanguinea*, Ruiz et Pav.) appears to have always played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Chocó, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power of discovering gold. In any place where the unhappy patients happen to fall down, digging is commenced; and, as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour *Chicha de Maiz*, a beer made of Indian corn, is administered.—*Hooker's Journal of Botany*, Sept., 1851.

ON THE PURIFICATION OF HIPPURIC ACID, BY MEANS OF NITRIC ACID.

BY J. HUTSTEIN.

AMONG the different methods of purifying hippuric acid that of Schwarz has always appeared to be preferable; the great loss of acid, however, with which it is attended, before obtaining the acid perfectly white, induced the author to adopt a new method, and he succeeded in discovering in nitric acid a means by which hippuric acid can be prepared in a short time, without any considerable loss, and perfectly white.

One pound of the crude recently-pressed acid (obtained by evaporating in the vapour-bath the urine of the horse to one-eighth of its volume, and separating the acid by muriatic acid) is mixed with an equal quantity of cold water, and to this

mixture four ounces of nitric acid of 1.30 sp. gr. are added with constant stirring. After about twenty-four hours the pasty-like mass is placed on filtering paper and washed with distilled water until the filtered liquid nearly ceases to possess a sour taste. The acid thus deprived of colouring matter, and in which not the slightest trace of benzoic acid can be detected, is dissolved in a sufficient quantity of hot distilled water, the solution filtered and crystallized. The crystals are one inch long, thick, and beautifully white.

[NOTE, by Mr. Bley (one of the editors of the *Archiv. de Pharm.*).—This notice was accompanied by a letter from Mr. Apothecary Müller, in which he states that after several preliminary experiments with the urine of different horses, Mr. Hutstein ascertained that the urine of pleasure-horses yields the largest quantity of hippuric acid, and he ultimately employed that of some horses belonging to a merchant, from which he obtained a large proportion of acid. After some time, however, having again provided himself with the urine from the same horses he was not a little astonished to obtain as the result of his operations benzoic acid instead of hippuric acid. He afterwards learnt that the same horses had subsequently to his last experiment been put to hard work, and that instead of being employed only now and then for a ride as formerly, they were daily employed in carrying corn to the mill, &c.]

This appears to confirm the so-often combatted assertion that by the hard working of animals, hippuric acid is converted into benzoic acid. Mr. Hutstein is too careful an observer to have employed in his investigations fresh urine and urine which had been for some time exposed to the atmosphere, unless we assume with Liebig that in operations on the large scale, it is hardly possible to avoid an admixture of stale urine, in which hippuric acid may have been converted into benzoic acid by the commencement of fermentation.]—*Archiv. d. Pharmacie*, 2 Reihe, B. lxvi., Heft. 3, p. 274, 1851.

ON THE SOURCES OF AMYGDALINE.

BY WILH. WICKR.

AMYGDALINE appears to be more general and of a greater botanico-physiological importance than has hitherto been supposed; and the following experiments show, that it is almost a general constituent of the Pomaceæ. Its presence has been proved by submitting parts of the various plants with water to distillation, and testing the distillate with a salt of iron for prussic acid, under the conviction that no other vegetable matter but amygdaline possesses the property of generating, under these circumstances, prussic acid. The experiments were performed in the month of May, in the laboratory at Göttingen.

1. POMACEÆ.

Pyrus Malus.—The distillate of the green leaves of the bark and of the flower-buds contained no prussic acid.

Sorbus Aucuparia.—The young shoots and the unfolded leaves yielded a strong hydrocyanic distillate; as did also the leaf-pinnæ, the petioles, and especially the bark. On the other hand, the distillate of the flower-buds, which had been broken off short from the peduncles, showed no hydrocyanic reaction.

Sorbus hybrida.—Hydrocyanic acid is contained in the bark, and still more abundantly in the young shoots of this tree, which grows wild in the south of Sweden, and occurs singly in Thuringia. The reaction was not so strong in the distillate of the leaflets and of the petioles, whilst that of the developed flowers became at first bluish, and only after a few days flocculi of Prussian blue were deposited.

Sorbus terminalis.—The distillate of the already far advanced shoots, divested of the leaves, smelt strongly of prussic acid, and yielded immediately a proportionately abundant precipitate of Prussian blue. A large quantity of leaves yielded a distillate, which became only bluish on being tested. The distillate of the flowers smelt of prussic acid, and corresponded nearly with that of the shoots. The distillate of the bark and flower-stalks resembled that of the leaves.

Amalanchier vulgaris.—The bark, taken from the preceding year's branches, contained a very large proportion of prussic acid. The leaves also yielded a hydrocyanic distillate; and although the proportion of prussic acid was but inconsiderable when compared with the quantity of leaves employed, still it was larger than in *Pyrus terminalis*. The distillates of the young fruits, stalks, and young shoots immediately showed the presence of prussic acid.

Cotoneaster vulgaris.—The distillate of the short shoots showed but a very slight hydrocyanic reaction, and the precipitate of Prussian blue separated only after a few days; in that of the bark, of the flowers deprived of their stalks and of the leaves, no hydrocyanic reaction took place.

Crataegus Oxyacantha.—Only at the commencement of their vegetation, the distillate of the shoots, about one inch in length, yielded immediately a precipitate of Prussian blue; still the proportion of prussic acid was very insignificant, and at a more advanced stage of vegetation, in no part of the plant could prussic acid be detected.

2. AMYGDALINE.

Prunus domestica.—Similar to *Crataegus*. The very young shoots yielded prussic acid, but neither the developed leaves nor the bark. The more advanced shoots showed in the distillate traces only of prussic acid.

Prunus Cerasus.—The bark of the root and of the branches, the leaves and the young shoots contained no prussic acid. Nor could any be detected in the distillate of the ovary.

Prunus Mahaleb.—No prussic acid could be discovered in the leaves, in the bark, in the very young and slightly developed shoots, and in the flower-racemes, although all these parts were repeatedly examined.

Prunus Padus.—This tree, as is well known, contains amygdaline in all its parts. By distilling the leaves considerable drops of bitter almond-oil were obtained, and on testing the distillate for prussic acid, an abundant precipitate of Prussian blue was obtained.

These experiments show that amygdaline is very general among the Pomaceæ, and that in many it is continually generated during the process of their development. With the various sorts of *Prunus* this appears to be otherwise. In the very young organs of the cherry and plum-trees no amygdaline could be traced, whilst in the kernels of the fruit of these trees it is contained in considerable quantities. There appears to exist here a similar relation to that which is found in *Crataegus* and *Cotoneaster*, where, when the young shoots begin to be developed, prussic acid is found in the distillate, whilst the other organs and the shoots at a more advanced period yield no hydrocyanic distillate.

That amygdaline has an active share in assisting the process of development appears also to be indicated by the fact that it is found in the largest proportion in the young shoots even of those plants, which contain it in all their organs, such as *Sorbus torminalis* and *Amalanchier vulgaris*.—*Annalen d. Chemie und Pharmacie*, B. lxxix., Hft. 1, 1851, p. 79.

FORMATION OF SULPHURIC ETHER BY CHLORIDE OF ZINC.

FUSED chloride of zinc is soluble in hot highly rectified spirit of wine, and if the solution of it be distilled, it gradually acquires the smell of sulphuric ether, and a specific weight of 0.796. The more concentrated this alcoholic solution becomes, and the more the temperature increases by continued distillation, the more distinctly the formation of sulphuric ether takes place; and the cause of its generation is, that at a certain temperature the affinity of the chlorine in the chloride of zinc for the hydrogen, and of the zinc for the oxygen, of the spirit of wine increases to such a degree, that decomposition takes place. We find, therefore, in the distillate, besides spirit of wine and ether, also a small quantity of muriatic acid, and in the residue free oxide of zinc. As chloride of zinc consists of one equivalent of chlorine and one equivalent of zinc, the alcohol must have lost hydrogen and oxygen in the same proportion as the latter form water; the ether must, therefore, necessarily be alcohol minus HO. This does, however, not prove that alcohol is a hydrate of ether, i. e., that the water is contained in it ready formed as such; on the contrary, it can be shown that alcohol is a simple organic substance. Chloride of zinc, distilled with water, lets the water pass over without decomposition, neither muriatic acid nor oxide of zinc being generated. It is, therefore, clear, that, if oxygen and hydrogen are once combined to form water, the affinity of the single constituents of chloride of zinc are unable to destroy this combination; and that, if the combinations are actually destroyed, as is the case in the present experiment, the oxygen and hydrogen cannot be united as water.

This experiment refutes the theory, according to which alcohol is said to be the hydrate of ether, and serves to corroborate the fact, that ether can in no way be changed again into alcohol by communicating water to it. If, therefore, alcohol

does not contain ready-formed water, it cannot be changed into ether by mere water-abstracting power, but only by water-generating power. And with this all experiments agree. Chloride of calcium merely abstracts water, but does not generate ether, for its constituents have so strong an affinity for one another, that they cannot be separated by the simultaneous attraction of the oxygen and hydrogen contained in the alcohol. Chloride of tin, chloride of antimony, and chloride of iron act in a similar manner to the chloride of zinc, destroying alcohol and generating ether; as also fluoride of boron and fluoride of silicon, which substances do even decompose the water and generate hydrofluosilicic acid and boracic or silicic acid. These facts speak strongly in favour of Dr. Mohr's theory of the generation of ether.—*Buchner's Report.*, 3th Reihe, Bd. viii. Heft 2, p. 238, 1851.

ON THE PRE-EXISTENCE OF HYDROCYANATE OF THE HYDRURET OF BENZULE IN FRESH CHERRY-LAUREL LEAVES.

BY F. L. WINCKLER.

WINCKLER concludes from some experiments which he has made, that the fresh leaves of cherry-laurel probably contain a small but variable quantity of hydrocyanate of the hydruret of benzule, corresponding to the proportion of their water, and which disappears on drying. The same is the case with the leaves of *Prunus Padus* and *Amgydalus Persica*.—*Central Blatt.*, No. xxi, 1851, p. 336.

REPORT ON SULPHURIC ACID IN THE AIR AND WATER OF TOWNS.

BY DR. R. A. SMITH.

THE experiments and observations of the report were generally directed to the existence and quantity of sulphuric acid in the atmosphere of large towns, and from the examples taken in and near Manchester. Dr. Smith, admitting that sulphurous acid was first produced by combustion, considered it was oxidized and carried down by rain as sulphuric acid, and usually associated with ammonia. Liebig had proved carbonate of ammonia to be present in the air. Dr. Smith found that rain-water was alkaline until boiling concentrated the sulphuric acid. Rain-water collected six miles from Manchester was such that it could not be used agreeably for drinking. He considers the soil as a great disinfectant of the rain-waters—removing the acids, the ammonia, and the oily and carbonaceous matters, that give unpleasant qualities to rain-water. Rain, collected even in the fields, on concentration had so much oily matter developed by evaporation, that suspicion of accidental impurity from the vessels employed was only removed by the employment of platina vessels. Specimens of air taken in the summers of 1850 and 1851 from the densest parts of Manchester were compared with air from the country. The quantity of sulphuric acid, estimated in a tabular form, ranged from 0.4 to 1.06 grains to the gallon—the chlorine was from 0.396 to 0.530 to the gallon—while the total quantity of inorganic matter in rain-water was from 0.8 to 3 grains to the gallon. Dr. Smith alluded to the growth of *confervæ*, and the production of some living bodies, and made observations on the office of rain-water, thus clearing the air of matters affecting the health of man.—*Report of British Association in the Athenæum.*

ON MEAT BISCUIT.

(Continued from page 30.)

TO DR. ALEXANDER DALLAS BACHE,
President of the American Association for the Advancement of Science, &c., &c.

Evergreen, Galveston Bay, February 1st, 1850.

I HAVE received from Mr. Gail Borden, Jun., a highly respectable citizen of this State, the accompanying letter, to which I beg to invite the attention of your learned body. Mr. Borden claims, as you will see, to have discovered a process for combining in a cheap, convenient, and portable form, all the nutritive portions of animal and farinaceous food. His invention has the further advantages that all refuse, excrementitious and superfluous matters are rejected; and that the meat-biscuit, for so Mr. Borden denominates his prepared article, can be preserved *fresh*, without condiments or preservatives of any kind, for years, and in all climates, care only being taken that it be kept dry. From several satisfactory trials, it is

proved that Mr. Borden's process is equally adapted for combining any farina, any flour, or meal, with any of the meats of the animal kingdom used by man for food; but he has hitherto confined himself to combining wheat flour with the flesh of meat cattle.

I have examined with careful attention, and have several times eaten of the soup made of the meat-biscuit; but before speaking further of its uses, I will briefly allude to the manner of preparing the biscuit in question. The nutritive portions of the beef or other meat, immediately on its being slaughtered, are, by long boiling, separated from the bones and fibrous and cartilaginous matters: the water holding the nutritious matters in solution is evaporated to a considerable degree of spissitude; this is then made into a dough with firm wheaten flour, the dough rolled and cut into the form of biscuits, is then desiccated, or baked in an oven at a moderate heat. The cooking, both of the flour and the animal food, is thus complete. The meat-biscuits thus prepared have the appearance and firmness of the nicest crackers or navy bread, being as dry, and breaking or pulverizing as readily as the most carefully made table crackers. It is preserved in the form of biscuit, or reduced to a coarse flour or meal. It is best kept in tin cases hermetically soldered up; the exclusion of air is not important, humidity alone is to be guarded against. I have seen some of the biscuit perfectly fresh and sound that have been hanging in sacks since last July in Mr. Borden's kitchen: and it is to be borne in mind, that in this climate articles contract moisture and moulder promptly, unless kept dry by artificial heat.

For making soup of the meat-biscuit, a batter is first made of the pulverized biscuit and cold water, this is stirred into boiling water; the boiling is continued some ten or twenty minutes—salt, pepper, and other condiments are added to suit the taste, and the soup is ready for the table. I have eaten the soup several times, it has the fresh, *lively*, *clean*, and thoroughly done or cooked flavour that used to form the charm of the soups of the *Rocher de caucade*. It is perfectly free from that rapid unctuous stale taste which characterizes all prepared soups I have hitherto tried at sea and elsewhere. Those chemical changes in food which, in common language, we denominate *cooking*, have been perfectly effected in Mr. Borden's biscuit by the long continued boiling at first, and the subsequent baking or roasting. The soup prepared of it is thus ready to be absorbed into the system without loss, and without tedious digestion in the alimentary canal, and is in the highest degree nutritious and invigorating. It is to be noted, moreover, that the meat-biscuit is manufactured without salt, pepper, or any condiment or chemical antiseptic whatever—thus the *freshness* or peculiar properties inherent to recently slaughtered meat are preserved, and a simple and perfect guarantee furnished of the goodness of any particular parcel. To the soup made of Mr. Borden's biscuit, as already intimated, salt and the various condiments used in soups may be added to suit the taste; also toasted bread, vegetables, &c., &c., as circumstances permit and fancy suggests, until the varied catalogue of the *potages* of the restaurateurs may be rivalled.

The different portable soups and prepared meats for long voyages which I have seen, answer only imperfectly the ends for which they have been designed. Being prepared more or less with condiments, these meats differ from freshly slaughtered animal food; they contain fibrous and indigestible portions, being more or less liquid in form they are inconvenient to carry, and besides, thus necessitate the transportation of useless bulk. The meats put up for long voyages in the manner just alluded to, are not wholly freed from fatty matters; these undergoing slight chemical changes in time, impair both the taste and quality of the food into which they enter; nor are these meats so completely cooked as by Mr. Borden's double process of boiling and baking.

I might here insist on the very great conveniences of Mr. B.'s meat-biscuit arising from its dryness. For long voyages it is best preserved in soldered tin cases or tight casks, but it may be carried in sacks suspended from one's saddle bow, for weeks or months over the prairies or through the desert without risk of spoiling, using care to keep it dry; and when a case or cask is opened, it may be economised for days or weeks according to circumstances; whereas the liquid portable soups and prepared meats must be at once eaten or they soon spoil, especially in damp or hot weather.

As no condiments nor chemical preservatives enter into the meat-biscuit, it retains unchanged and unimpaired all its qualities of freshly slaughtered meat; and as already intimated, furnishes its own evidence and guarantee of soundness at the time of using.

As the meat-biscuit requires only ten to twenty minutes to be made into a hot delicious soup, with the aid of fire and water only, its advantages for family use, for hospitals, at sea, and on long journeys over land, and wherever it is desirable to prepare food promptly, must be obvious.

The paramount excellence of Mr. B.'s discovery appears to me to consist in this, that it is a meat-biscuit—it is meat *and* bread. Human life may be sustained, as we all know, on a diet of a single kind, but the highest degree of corporeal and mental strength and health can be long maintained only by the use of both vegetable and animal food, especially when labours, fatigues, and privations are to be undergone. I believe there does not exist in nature or art the same amount of nutriment in as small bulk or weight, and as well adapted to support, efficiently and permanently, mental and physical vigour, as is concentrated in the meat-biscuit in question. One ounce of the biscuit meal makes a pint of rich, invigorating animal and farinaceous soup. The biscuit being converted into soup by its combination with water, all the requirements of a good food are answered, animal and vegetable aliment in a sufficient *bulky* form.

Dr. Franklin has observed in his memoirs, that the nutriment of a half-penny-worth of malt only is contained in a pint of ale: this is one of the very few errors into which that practical philosopher fell. As in malt liquors so in soups, there is a chemical union of the alimentary matters with the water, and we have in soup the *bulk* and *elements* of the water as well as the animal and vegetable principles, *all* which are necessary for sustaining the human system. I mention this to illustrate the fact, that soup made of the meat-biscuit will go as far in supporting life as several times the like quantity of *dry* bread and meat, with water separate as a beverage.

If my limits permit, I shall further on cite some facts to show that the meat-biscuit can be prepared at a very low price in countries where, as in Texas, heeves on foot are extremely cheap; from its small bulk the cost of transportation to other countries will be light.

We have thus in the meat-biscuit an article of food, partly farinaceous and partly animal, such as the system requires for long continued use; it is easily preserved in all climates, seasons, and circumstances; it is in a form the most concentrated and convenient for carriage; it is prepared with little trouble and speedily; by its cheapness it is accommodated to universal use.

The advantages of the meat-biscuit for hospitals are obvious; a nice, cheap, fresh, invigorating, and easily digestible soup can be prepared in a few minutes, at the moment almost when the taste and condition of the patient require it.

For private families, and especially small ones, and in the warm season, it is convenient by dispensing with the long hours of boiling required to prepare ordinary soups.

On long sea voyages it furnishes at a cheap rate, that indispensable requisite of health and preventive of scurvy, an occasional ration of fresh meat. But it is not for long voyages alone to which it is adapted. Every one who has been at sea knows the sparing use of fire on board ships. What could be more grateful, invigorating, and healthful for the sailor, dripping with water, and shivering with cold, than a bowl of hot soup, well seasoned with pepper or other warming condiments? and how vastly more salutary than the ration of grog!

It appears to be a part of the mission of America, if I may use the phraseology, not merely to furnish a home to the refugees from the oppressions and crowded population of the old world, but also to feed in part the poor of those countries who *never taste good* meat, and to whom even a miserable flesh is a great rarity. Baron Dupin, in 1815, estimated that two-thirds of the French nation did not taste meat once a week, and such meat as falls to the lot of the poor. My personal observation confirms his statement; and this is deemed too, a favourable average for the continent of Europe. The destitution of the starving Irish has, through the newspapers, been made painfully familiar to everybody. The meat-biscuit can be furnished at such rate, and at so small a cost of transportation, that a meal of *sound* animal food may be in reach of almost every pauper and every beggar in Europe, unless its introduction be debarred by restrictive duties.

There are other uses nearer home which would furnish a market for, and be greatly benefitted by the meat-biscuit. Without mentioning more particularly our plantations, I will barely allude to the fact, that immense quantities of jerked beef are annually imported from South America into Cuba, for the sugar and coffee plantations of that island; with equal freedom to import the meat-biscuit, the latter would drive the jerked beef from the market.

The uses of the meat-biscuit hitherto mentioned, apply to ordinary life ; there are other wants and necessities which may be considered as in some degree new or occasional, developed in part by the spirit of enterprize which characterizes the age we live in : in part by new discoveries and great political changes, which wants and necessities can be met and answered adequately only by the meat-biscuit. I refer to enterprizes where, with small means of transportation, regions are to be visited containing only scant supplies, or wholly destitute of provisions, as in traversing wildernesses of days' and in weeks' journeys each—such as the vast solitudes in the interior of our great western territories, where, under the most favourable circumstances, the local means of subsistence are extremely scanty and precarious ; and where, amid the vast mountain ranges to be crossed, travellers may be overtaken with snows of weeks and even months duration ; such also as in journeys over the sandy *jornadas* of Mexico ; or in traversing the almost boundless deserts of central Africa, or in penetrating the regions of eternal winter which surround the poles. For all such enterprizes, whether of war or peace, of commerce or science, the meat-biscuit is pre-eminently adapted ; furnishing ample nourishment, so small in bulk, and so light of weight, as to admit of easy transportation. On expeditions in inhospitable regions such as alluded to, to enable the system to withstand the extremes of heat or cold, or the influence of pestilential climates, it is not enough to possess the means of merely keeping body and spirit together ; success and safety, amid the privations incident to such exposure, depend on maintaining the mind in high tone as well as the body ; for this purpose a good nourishing diet, consisting both of animal and vegetable food, such as furnished by Mr. Borden's discovery, is absolutely necessary. The English, in their East Indian expeditions, used, some years since, to take supplies of animal glue, with which they made soup ; so far as I know, they still do so. The meat-biscuit is in every respect a greatly superior article ; as well as to *pemmican*, still used on long sea voyages.

The settlement of Oregon, and the incorporation of the Californians into our Union, render a direct communication overland with those distant territories one of the most urgent political and industrial wants of our country. A vast railroad has been projected ; under the most favourable circumstances long years must elapse before it could be constructed ; it is proposed in the meantime, to pierce the continent at one or more of its narrow isthmuses further south, as an imperfect substitute for direct communication—themselves most gigantic enterprises. All the while with the rapid progress of our people westward, the necessity of a direct intercourse with the Pacific regions and with the vast intervening districts, for the purpose of making settlements, is more and more imperative.

One ounce of the meat-biscuit makes a pint of rich nutritious soup. Five ounces a day, or a pound for three days, would be an ample supply for one man. Three hundred pounds is commonly estimated a mule load ; let us take half this weight, or one hundred and fifty pounds as a load, as subsistence for the mule is scanty in places and the journey long, we see that a light mule load will alone support in high health, seven men upwards of two months. The meat-biscuit is the bridge across the wilderness, it is the true manna in the desert.

The iron men of the frontier may, with perhaps a little parched corn in their pockets, plunge boldly into the wilderness, relying for subsistence on their rifles. Even they must not go in too large companies ; but the difficulties to be encountered are not imaginary, as the privations and disasters of numerous expeditions, since the discovery of the California mines, too well testify. A company started from Galveston for California by the overland route ; they were reduced to eat their mules, and at length compelled to return, without accomplishing their journey. A few pounds of the meat-bread would have obviated this calamity and disappointment.

The newspapers have made the country familiar with the frightful sufferings of Col. Fremont's late expedition to discover a route south of the South Pass, and with the disastrous fate of some of his companions. These men who perished miserably on their way on foot to the settlements, might have easily carried even in their coat pockets, enough of the meat-biscuit, with the aid of a tin cup and box of matches, to have enabled them to reach the settlements in health and safety. Ten pounds, a weight easily packed by a foot traveller, is sufficient for thirty days' subsistence. The fire for cooking is one of the greatest dangers in the Indian country, as it betrays the situation of the camp to the hostile Indian ; the advantage of a small and momentary flame, such as is adequate to prepare the meat-biscuit, will not be lightly estimated by persons whose path has been among hostile Indians. Our frontier, it is to be feared, will be long subject to Indian depredations. Mr.

Borden's discovery greatly adds to our means of prompt and efficient pursuit and protection.

Indeed, I feel quite confident that the meat-biscuit will, ere long, form a part of the indispensable supplies of every expedition into our western wilds, and of every military corps on our frontier.

Every one familiar with the recent Mexican campaigns, remembers the delays and embarrassments occasioned by want of rations of easy transportation. It was often impracticable to pursue even a small corps of the enemy. A similar want has been the chief difficulty experienced by the French in the subjugation of Algiers; for want of subsistence the French troops could not pursue the Arabs in their razzias, on their retreat to the mountain fastnesses. We have here the means of obviating similar difficulties, delays, and embarrassments hereafter. Every invention which shortens war, is a gain to humanity.

Expeditions are in progress to discover Sir John Franklin, who, if alive, is probably frozen up in regions of eternal snow. Where ships are detained by ice for months, or crushed and destroyed by it, the seamen may make good their retreat, provided they can carry food enough to serve them by the way. I need not allude particularly to cases where ship's crews are compelled to take to their boat, or the thousand similar casualties to which they are liable.

For upwards of a thousand years, science, commerce, and philanthropy have cast wistful and longing eyes towards that terra incognita, hidden in the interior of Africa. An opinion has long prevailed, that in the hitherto inaccessible regions of that immense continent, mineral wealth, vegetable productions, animals, and perhaps forms of civilization exist, as yet unknown to the rest of the world. Among the formidable obstacles to be encountered in penetrating thither, has been the want of a suitable food to sustain life on the journey from the coast. The vegetable gum, known as Gum Arabic, has been the chief, and indeed often the sole resources of the traveller over the desert and through the swampy countries; this barely supports life, but does not impart the mental and physical vigour requisite to resist the prostrating influences of those hot and deadly climates. Mr. Borden's discovery supplies this want; light and not bulky, and not liable itself to be spoiled and rendered unfit for use by the climate.

To enumerate the various uses for ordinary life, and new occasions which the meat-biscuit may subserve, would extend this already long letter to a most unreasonable length: they will become more and more obvious on reflection to every man of observation; but it would after all, be a discovery of only limited utility, unless it can be furnished at so low a price as to enter into free competition with the ordinary means of subsistence. From conversation with Mr. Borden, and learning the manner of preparation and the cost of materials, I am satisfied it may be one of the cheapest articles of food. Putting it up in tin-cases or casks, costs less than barrelling the like amount of beef; being much smaller in bulk, and dry, its transportation is less. Indeed, it may be taken where the cost of freight on beef or pork would debar the introduction of these latter articles. Among our staple productions in Texas are beef cattle, which find abundant pasturage on the broad prairies at all seasons, the cost of beef on foot may be estimated at one and a quarter cent. per pound.

Public confidence in an article like the one which forms the subject of this letter, depends greatly on a well-grounded assurance of its careful and correct preparation. Being made without any condiments or chemical antiseptic, its taste and smell are at all times evidence of its soundness and faithful manufacture.

It has appeared to me, that an invention promising so much practical convenience and utility, deserves the examination and judgment of your learned association. I shall accordingly forward to Charleston, in time for your semi-annual meeting next month in that city, some of the parcels of meat-biscuit placed at my disposition by Mr. Borden. It is also my intention to transmit others of the parcels to the American Medical Association, which will meet in Cincinnati in June next, for their examination and judgment.

I have the honour to be, Mr. President and Gentlemen, Members of the American Association for the Advancement of Science,

Your very obedient Servant,

ASHBEL SMITH.

NOTE.—Mr. Borden has received intelligence of the granting of letters patent for the invention, vesting in him and his legal representatives, the exclusive right to the same.—*Publishers.*

DISCOVERY OF GOLD IN AUSTRALIA.

THE announcement of the discovery of an extensive and prolific gold field near the Blue Mountains of Australia is likely to give a new direction to the current of emigration among gold-seekers. The reports which have appeared in the newspapers, and which were at first received with some scepticism, have in most respects been confirmed by more recent and better authenticated statements. The Government being satisfied of the existence of great quantities of the precious metal within their territories, have issued a proclamation asserting the right of the crown to all gold found either on the lands of the Queen or on those of private individuals, declaring that all persons searching for gold within the district in which it has been discovered, without licence, would be punished according to law, and stating that regulations would be immediately made for granting licences on the payment of a reasonable sum. The charge for a licence has been fixed at £1 10s. per month. At the date of the last intelligence, about the middle of June, it was estimated that from 16,000 to 20,000 persons of all classes were congregated in the gold district, and the excitement which prevailed throughout the whole country seemed to threaten a complete disturbance of the regular industry of the inhabitants, so that the price of labour had risen in some places 50 per cent., and the price of food to even a greater extent.

The dissemination of this intelligence in the mother country cannot fail to excite a desire for further information respecting the distribution of gold in the earth, and the circumstances under which it has now been found in such abundance in one of our colonies; and we are, therefore, induced to insert the following extracts from a paper by Mr. W. B. Clarke, who appears to have been one of the first to direct attention to the subject.

"In the first place, it is to be noticed that gold is one of the most universally distributed of metals in rocks of a certain class, and that there is scarcely a river of any volume upon the face of the globe in which it does not exist in small quantities, the sands and gravels of which will pay for the washing, provided they yield at least twenty-four grains per cwt. It must, however, be borne in mind that these sands are always derivable from rocks of a certain antiquity that have undergone certain changes, and that the notion entertained, even by some persons who profess knowledge of geological principles, that gold is still forming, is without a shadow of evidence, and totally contradictory to everything that has been ascertained on the subject. Such a notion can only be entertained by those whose experience is limited, or whose inquiries have just commenced, and who have not had sufficient acquaintance with field geology to be able to read off the testimony of nature.

"Now, with respect to the sources of gold, they are twofold. The metal either occurs diffused in certain rocks, or has been spread over the surfaces of the hills and their bases by the violent action of water, which at a former period in the earth's history has broken up and dispersed the fragmentary ruins of the upper beds of rock over the surface of the flatter regions below.

"Such is the history of the origin of all alluvial gold beds, whether in Russia, California, or Australia. But these alluvial deposits are frequently found on the banks of creeks and rivers, because the creeks and rivers themselves flow in channels excavated through these deposits, and, therefore, expose in their banks the contents of the soil through which they flow. The depth and width of these channels vary, necessarily with the volume of the water and the slope of their declivities. Thus, in California, where the river sources are fed by the snows of the Sierra Nevada, and the hills are lofty, the river beds of the auriferous region are wide and deep, and interrupted by cascades which, of themselves, are of the utmost importance from the fall and quantity of water to the operations of the gold-washers.

"In Australia, where the creeks are narrow and the waters scanty, of course the difficulty is greater in washing the detritus. Hence, much gold that exists here will be lost.

"With regard to the original source of the gold in the alluvia, it may be said generally that, contrary to the usual law which obtains in the history of metals, it is only the upper and not the lower portions of veins that are prolific, and, therefore, one argument insisted upon by some persons, viz., that it is necessary to have very high mountains to expect much gold, is not sustained, either by general experience or the actual facts that have been exhibited in the Ural, where some of the most prolific sources of gold are at an elevation under 1000 feet above the sea. Miask and Ekaterinburg are each below that level. Kyshtimsk is only 630 feet. Mount Bladogat, below which are gold mines, is only 1,516 feet, and

Bogoslovsk, little more than 500 feet above the sea. Even the high lands of **Uf Tash**, behind **Minsk**, which are of chloritic schist, are only 2,156 feet high. And although there are high points in the Ural equivalent to 5000 English feet and upwards, yet it is very remarkable that the most prolific localities are of the very moderate elevation before mentioned. *Prima facie*, therefore, there is nothing to dispute the supposition, that the auriferous detritus of Australia may be infinitely richer than is by some imagined. The reputation of a geologist, which would be staked upon a contradiction of such a supposition, would, with the history of the Ural before him, be in imminent danger.

"When in 1841, and subsequently from year to year with increased conviction, as the results of my inquiries came before me, I announced that Australia was an auriferous country; and when in a letter (I think to Sir H. de la Beche) which has been quoted in the *Quarterly Review*, it was said that gold, as well as copper and lead, is in 'considerable abundance' in our schists and quartzites, it was no hypothetical assertion. I simply declared what I believed on evidence which was in all points consistent with the full exploration of the Ural and the rivers of California, and which the perseverance of gold-seekers has now fully confirmed. Nor do I shrink from further declaring, what time will establish, that the present gold field is but one of numerous localities along the Cordillera, in which gold and gold alluvia will be found by those who search for them.

"As a geologist, fully aware of the risk which my reputation may run in all prospective statements, I declare it to be my belief that the axis and flanks of our Australian Cordillera are of the same geological epoch, and have undergone similar transmuting influences with the axis and flanks of the Ural; that in constituents, in changes produced by igneous action, in age, in almost every phenomenon, and in elevation above the sea, in standing as a wall between the sea and a desert, just as the Ural stands as a wall between what was sea long after our Cordillera became dry land, and the desert of Siberia, there is a most perfect analogy in all respects in these distant chains; and, therefore, it is not blind hypothesis, but careful analysis, which has brought me to predicate of Australia, what is now geological history in Russia.

"Again, look at the direction of these chains. It was Humboldt who first remarked, that gold is a constant deposit in meridian-directed mountains. The Ural, the ranges of California, and the Australian Cordillera have verified the dictum; for there is not a greater deviation in Australia from a true parallel to the meridian than there is in the Ural, which is deflected between north and north 35° west in the northern part of its course, and between south and south 45° west in its southern expansion.

"There is, however, one striking fact which I cannot omit in this place—a fact never before mentioned. If we look at the globe, we shall find that in the longitude of about 149° or 150° east extends the middle or the meridian chain of Australia, paralleled by similar chains, having similar axes, in South and in West Australia. Exactly 90° from the main Australian chain occurs the auriferous Ural in 60° east, and exactly 90° from the same chain occur the north and south auriferous mountains of California in 120° west. The fourth quadrantal meridian falls along the Atlantic, between Brazil and Africa, both auriferous regions.

"In three of these meridians the earth has been fissured, and igneous rocks have pierced and transmuted elevated schistose beds.

"When this fact first struck my mind, I received a fresh light, and guided by it I saw, that if a careful examination and comparison of the natural formations of California and the Ural would justify it, I should be safe in positively asserting what I did, and from the effect of which assertion explorers have been led to verify my conclusions."

ON THE DISEASE OF THE GRAPE-VINE CAUSED BY THE PARASITIC FUNGUS OIDIUM TUCKERI.

For three or four years past, the grape-vine in this country has been subject to a disease, which, in some instances, has destroyed entire crops of the fruit, and this disease is now extending its ravages on the continent, in districts where the grape is largely cultivated, and where the failure of the crops is a serious calamity. The immediate cause of the disease appears to be a small parasitic fungus, called *Oidium Tuckeri*, which is found adhering to the fruit, and also to

the stems and leaves of the vine. The grapes, when thus attacked, look as if they were covered with a white powder; the skin of the fruit becomes hardened and frequently bursts, either from contraction or from its not expanding in proportion to the growth of the seeds contained in it, and ultimately the fruit shrivels up without coming to maturity. Two or three cases of this kind have recently come under our notice, and we have heard of others in which numerous unsuccessful attempts have been made by chemical and other means to remedy the evil. The subject is engaging much attention abroad, as will be gathered from the following paper by M. BOUCHARDAT, which is taken from the *Repertoire de Pharmacie* :—

I CONCLUDED a memoir, which was read before the Central Society of Agriculture on the 9th of August, 1850, with the following sentence :—

“Considering the ravages to which the vines are subject in those districts in which forced cultivation is practised, it becomes indispensable that this mode of cultivation should be absolutely relinquished in the neighbourhoods of our large vineyards.”

I now propose, as the invasions of the parasite are again threatened, to call the attention of vine-growers to this important subject. It appears to me, from the facts which I shall state, that the future good of the vineyards of France would be seriously compromised if, calculating on the facility of transport, some of the cultivators in the south should adopt forced cultivation with the view of meeting the demand for early grapes.

According to the numerous accounts which I received towards the end of 1850, from all our large vineyards, the *Oidium Tuckeri* had committed its ravages, in France, in the conservatories and open vineyards of Paris and its neighbourhood, and probably also in some of the vineyards of Lyons. I had thought that this year the fatal parasite had not much extended its devastations.

Shortly before the communication I lately made to the Central Society of Agriculture, respecting the renewed attacks of the *Oidium* in the vineyards about Paris, I was informed, but without any precise details, that the disease had appeared in the departments of Charente and Provence. I have since received an alarming statement, because it comes from one accustomed to such observations. The following is an extract from a letter addressed to me on the 3d of August, by my uncle E. Bouchardat, a member of the Agricultural Society of Grenoble, and a botanist well acquainted with Alpine plants :—

“I read, at the time, your memoir on the ravages caused by the *Oidium Tuckeri*, but I had not then had occasion to observe the disease, as it had not appeared in our district.

“This year, unfortunately, the case is otherwise. A friend of mine, living about a mile from Grenoble, who had a grape-vine trained against a baker's oven, with a south aspect, the fruit of which usually ripened by the 18th of June, wishing to secure an earlier crop of fruit, constructed a conservatory over the vine; but the next year the grapes were found to be slightly attacked with the disease just as they came to maturity. This year, towards the end of May, the disease commenced; some time afterwards it extended to the out-door vines in the neighbourhood, and by the end of July all our vineyards, which are very extensive, were seriously attacked.”

The attacks of the *Oidium* have been similarly developed in the conservatories and vineyards of Isere as in those of Paris. The development of the disease may be traced evidently to a forced cultivation. I may here state some of the details of the evidence which I have already adduced, to show that the disease in France has thus originated, and subsequently spread out of doors. If the existence of the *Oidium* had been independent of defective cultivation, the effects, like other diseases, would have been more particularly developed in those places where the vine has been longest and most extensively cultivated. But we have no account of any such disease having attacked the vines of Burgundy, which have been naturalized among us for so many ages. It was in the conservatories of England and those of Belgium that the *Oidium* was first observed, and it is very probable that it had existed prior to 1845, the time at which it attracted the attention of Mr. Tucker, gardener, of Margate. Several statements which have been made to me seem to authorize the opinion that the *Oidium* had existed in the conservatories in Belgium almost ever

since the cultivation of early grapes. Its ravages, however, were not so marked as they have been since the introduction into the conservatories of the grapes called "*franc-kintal*" and "*gros coulard*," for which the *Oidium* seems to have a sort of predilection. These are the evidences which I have before adduced in support of the opinion that the *Oidium* is first developed by forced cultivation, and from thence its propagation takes place. I may further state the facts observed in Paris and its environs. It was in the conservatories of M. Rothschild that the *Oidium* first made its appearance to a slight extent in 1847 and 1848, and afterwards, in a more marked manner in 1849. From thence it spread to the neighbouring vineyards, and extended, as we are told by M. Péjeard, to the vines of Suresnes Puteaux.

In 1848 the *Oidium* appeared in the conservatories of Versailles, and shortly afterwards attacked the adjacent out-door vines.

In 1849 the *Oidium Tuckeri* slightly showed itself in the conservatories of M. Pommerit, at Charonne, on the 2nd of July, after the gathering of the early crop, which was scarcely affected by it. In 1850, it was in the month of May, that the *Oidium* appeared, and its attacks were most severe at the end of June. A few weeks later the effects extended to the environs—to Charonne, to Montreuil, to Saint-Maudé, and to Conflans, in the Faubourg Saint-Antoine.

In 1850 the *Oidium* appeared in the conservatories of a nurseryman of Montrouge. A few days afterwards it spread to the most exposed out-door vines of Montrouge, of the boulevard D'Enfer, and from thence to the fine collection of the Luxembourg.

I knew that there existed at Sarcelles, a short distance from Paris, a forced cultivation of vines; I ascertained that this had not escaped the visitation of 1850, and that the *Oidium* had attacked the out-door grapes of Sarcelles.

Here then are evident cases, which, added to those of Grenoble, give additional importance to this practical fact, that, in the central part of France, it is in the forced cultivation of the vines that the evil originates, from thence to spread to those cultivated in the open air.

Let us examine with care the objections which have been raised to this interpretation of the facts. "If the disease be endemic," says M. Léveillé (*Revue Horticole*, 16th June, 1851), "if it depends upon a particular state of the stock, it is but natural that those which are enclosed in conservatories should suffer sooner than those grown in the open air, as their vegetation precedes that of the others. The fungus cannot be developed in the same time on plants placed under such different circumstances."

This is perfectly true, but it offers no explanation of the well-ascertained fact, that up to the present time the *Oidium Tuckeri* has always shown itself, in the first instance, in the neighbourhood of heated conservatories, and that, notwithstanding the extended culture of the vine in France, there was not, up to 1851, a single instance of the development of the fatal parasite in the vines far distant from those of forced cultivation.

M. Léveillé again adds, "If the malady be contagious why should a preference be shown for white grapes and a repugnance for the black?" This repugnance for black grapes is not justified by facts, as this year the black grapes are attacked by the *Oidium* as well as the white. Last year in the vineyards of Paris, where the white chasselas is often associated with the black madeline, this latter might be said to have escaped, while the former was much attacked. This year, however, it is otherwise, for the black madeline is as much attacked as the chasselas. These results are easily explained. When the sporules of the *Oidium* escaped last year from the conservatories, the fruit of the black madeline had already turned, and, at this period of maturity the *Oidium Tuckeri* did not find the soil which it required, whilst it thrived remarkably well on the green grains of the chasselas of the size of peas or hemp-seeds. This year the stock of the vine was infested with the sporules which were not destroyed during the mild winter, and the black madeline was attacked before its maturity, the *Oidium* committing rapid ravages at this period of its vegetation.

This year, the *Oidium Tuckeri* appeared in Paris from the 6th to the 8th of July, and since that time has made considerable progress. To my knowledge it has shown itself on all those out-door vines which it attacked last year. Thus I am aware of its existence at Charonne, in the Faubourg Saint-Antoine, at Montrouge, at Conflans, at Charenton, in the Faubourgs Saint-Marceau, Saint Jacques, at the Barrière d'Enfer, and at Passy. Several gardens which escaped in 1850 are attacked this year.

In the environs of Paris, Sarcelles is attacked as last year, the fine vineyards of Tomery are not spared; but what is most to be regretted, the fine collection of the

Luxembourg suffers most severely. From all I have seen I am convinced that in Paris the disease is much worse than it was last year.

What remedies should be employed to arrest the progress of this evil? This is the question which is addressed to me by those persons who know my zeal in all that relates to the study and cultivation of the vine.

For the remedy of the present evil several means have been recommended. That which has succeeded best with M. Tucker, consists of a mixture of one part of sulphur, one part of lime, and 100 parts of water. At Versailles and in many other parts, the lime has been omitted, and water, in which flowers of sulphur was suspended, has been used. Tar-water has been much recommended. I have used successively, milk of lime, either pure, or holding a small quantity of oil of turpentine in solution, or a solution containing a thousandth part of sulphuret of calcium.

At present the most usual practice is to use a lotion consisting of water, holding a little flower of sulphur in suspension, or to sprinkle flowers of sulphur over the grapes previously wetted.

How is the return and the extension of the disease to be prevented? This is a question of great importance.

I hoped, and I still hope, that the vitality of the sporules of the *Oidium Tuckeri* may be destroyed by continued cold, and especially by snow covering the ground for several days. This opinion is founded on the following observation:—The vines of Suresnes and of Puteaux were attacked in July, 1849. During the winter, 1849-50, the ground was covered with snow for several days, and in 1850, the parasitical fungus did not extend its ravages in those vines attacked by it in 1849.

The slight frosts of the winter of 1850-51, did not suffice to destroy the vitality of the sporules of the *Oidium Tuckeri*, at least not in all localities, as in several gardens where the invasion was tardy and slight in 1850, it was premature and complete in 1851.

Some persons observing that the wood itself was affected, have proposed to cut down the diseased vines to the roots. This is a practice which I cannot recommend. It has been tried by several growers, but the results have not been satisfactory.

ON A NEW TEST FOR IODIDES.

BY DAVID S. PRICE, PH.D., F.C.S.

HAVING, in the preceding paper (*Pharmaceutical Journal* for September last, p. 132) pointed out the principle on which the detection of nitrites by means of iodide of potassium and hydro-chloric acid depends, I shall proceed briefly to describe the application of nitrites for the detection of iodides, and at the same time give one or two instances of the practical application of the test, in cases where the quantity of iodine is exceedingly small.

The method of employing the test is the following:—The liquid suspected to contain an iodide is mixed with starch-paste and acidified with hydrochloric acid, a solution of nitrite of potassa is then added, when, if much iodine be present, a dark-blue colour will be instantly produced; if a very small quantity only, as for instance, the two or three millionth part, then a few seconds elapse before the blue colour makes its appearance. In this manner I have detected the $\frac{1}{1000000}$ part of iodine dissolved in water as iodide of potassium. It will be seen that the test admits of a degree of delicacy not attainable by any of the other methods for detecting iodides, as well as being at the same time free from the disadvantages to which they are more or less subject; as for instance, in the employment of chlorine, which, unless added very carefully to a liquid containing a trace of an iodide only, is almost sure to afford a negative result, from the chlorine combining with the iodine, and so preventing its acting on the starch. The same error may also arise by the use of nitric acid, should the suspected liquid contain a large amount of chlorides.

I will now detail the two cases in which I have applied this test, in the one for the purpose of detecting iodine in cod-liver oil, the object being to see how small a quantity of the oil would suffice; in the other for the purpose of detecting iodine in marine vegetation. One ounce of ordinary brown cod-liver oil was saponified by a concentrated solution of caustic potash, and then carbonized in an iron spoon over an open fire; the residue was removed into a covered porcelain crucible and strongly heated, so as effectually to destroy all organic matter, and when cold, was digested with a small quantity of water and thrown upon a filter; the filtrate being acidified

with hydrochloric acid, was then mixed with starch-paste, and tested with nitrite of potassa, which almost immediately produced a pale plum colour.

Sea-water contains so small an amount of iodine, that it is exceedingly difficult to detect even a trace of it in the mother-liquor from several pounds of water. Minute as this quantity must be, it is nevertheless collected and assimilated by many marine plants, and the following experiment enables us to demonstrate its presence in their juices. If we take a thin transverse sectional slice of the stem of the *Fucus laminaria digitata*, moisten it with a little starch-paste and dilute hydrochloric acid, and examine it by the aid of the microscope, we shall, upon adding a drop of a solution of nitrite of potassa to the same, be able most distinctly to observe the formation of iodide of starch. The presence of an iodide may be shown in a still more marked manner, by suspending the stem of the same plant in a dry atmosphere, when the surface, after the lapse of some hours or days, will become covered with numerous transparent crystals, which, on examination, will be found to consist principally of chlorides, but at the same time to contain so much of an iodine-compound as to impart an intense blue colour to the test-mixture.

Many marine plants, when placed in a fresh state in contact with the test-mixture, impart an orange colour to it, owing to the liberation of bromine.—*Quarterly Journal of the Chemical Society.*

PARTIAL QUALITATIVE ANALYSIS OF THE TOMATO.

(*Lycopersicum esculentum*—*Solanum Lycopersicum*).

BY JNO. T. PLUMMER, M.D., OF RICHMOND, VA.

I HAVE long wondered why the acid of a fruit so extensively used as the tomato, should not have heretofore been determined. My earliest supposition was, that the character of the acid had been ascertained, but that the course of my reading had not brought the analysis into my view. But years have past, and I have not yet met with the slightest allusion to the quality of the acid, until to-day, in turning over the pages of the *Transactions of the American Medical Association*, I perceive that Dr. Porcher reports that this "fruit contains a *peculiar* acid." I have italicised the word "*peculiar*," because it implies, that whoever attempted the analysis must have failed to determine the true character of the acid; for, so far from being *peculiar* to the tomato, it is common to very many acid fruits.

It may be that the reporter did not wish to imply that a chemical examination of the acid had been made; but that, selecting his adjective rather carelessly, he merely intended to signify, that the fruit contained an acid—an agreeable acid, or an unknown acid. Be this as it may, it appears that the Association gave, on this occasion, no additional information on the subject. The fact that the hundreds of intelligent Physicians, who composed the Association, allowed the statement to pass without note or comment, is presumptive evidence that the character of the tomato acid was not known to them. And if not known to them, to whom was it likely to be known?

Assuming, then, that no examination of the acid in question has been made public, I proceed to give the result of my own researches into the subject.

Every attentive person must have perceived, that the agreeable flavour of the tomato is due to the semi-transparent mass that occupies and often fills the seed cavities and envelopes the seed. In this translucent pulp the acid is to be found. The parenchymatous portion of the fruit does indeed contain acid enough to redden litmus, but not enough to be perceptible to the taste.

The yellow tomato was the variety upon which I operated.

1. The glair of the ripened fruit was subjected to pressure in a clean muslin cloth, and the acid juice obtained was then boiled in a Berlin evaporating dish, to coagulate the albumen present. Of this there was a considerable quantity, but it was easily separable by heat—the acid present no doubt facilitating the process.

2. The liquor was then filtered through paper, limpid and colourless. Tested with litmus paper, it proved to be strongly acid. This, indeed, was obvious to the taste.

3. This acid liquor was neutralized with ammonia. Both this alkali and potash gave to the liquor a wine-red colour, which was discharged by an addition of the tomato juice, or other acid.

4. To the neutralized liquor (3) was added chloride of lime. This dissipated the wine-red colour, but produced no precipitate. Ebullition in a test-tube, however,

for a few moments, yielded a white precipitate. This experiment indicated the absence of oxalic, malic, tartaric and paratartronic acids, and the presence of citric acid.

5. The white precipitate (4) was soluble in chloride of ammonium. This solution boiled, again yielded a white precipitate. This reaction with sal-ammoniac afforded another evidence of the absence of paratartronic (racemic) acid.

6. The ebullition of (4) was continued until no more precipitate fell. To the decanted liquor alcohol was added, but the liquid remained clear. This furnished additional evidence of the absence of malic acid.

7. The acid juice (2) was neutralized with lime-water. No precipitate appeared. On boiling, flocculi were produced, and these were redissolved on cooling. This reaction indicates citric acid, to the exclusion of almost every other organic acid.

8. The acid juice (2) was treated with acetate of lead. A very copious, heavy, white precipitate instantly fell. This precipitate was readily soluble in citrate of ammonia; thus again denoting the presence of citric acid.

9. To the filtered, neutralized juice, was added sesquichloride of iron. The liquid assumed a yellowish-green colour, and remained perfectly transparent. The absence of any reaction in this case excludes the idea of tannic, gallic, acetic, and benzoic acids being present.

Thus, then, I determined the certain existence of *citric acid* in the tomato, and the absence of all other acids. Other reagents were employed besides those named; but, as they all produced corroborative evidence of the presence of citric acid, to the exclusion of others, I have not thought it necessary to add their indications to the foregoing.

It now became an interesting question, whether the acid discovered was wholly free, or in combination with a base. To resolve this problem, I added to the acid juice (2) a solution of tartaric acid in excess, and strongly agitated the mixture. A granular precipitate was formed, characteristic of *potash*. Tartrate of lime would have redissolved in the excess of tartaric present, and would also have disappeared in sal-ammoniac solution, which did not occur with the present precipitate.

Citrate of potash, then, with excess of citric acid, is the salt which gives to the tomato its agreeable flavour.

George Dow (*General History of Dichlamydeous Plants*, in four ponderous volumes, London, 1831), says the esculent tomato was cultivated as early as 1596. Can it be possible that so much time has elapsed, and this fruit has been so very generally relished in different nations, and yet no one has heretofore been prompted to examine in the cause of its palatableness?

I have some further observations to make on this plant, and especially on its medicinal properties; but they will, perhaps be more appropriate on another occasion.—*American Journal of Pharmacy*.

[The author of this paper seems to be unacquainted with John's analysis of this fruit; as well as with Foderé and Hecht's analysis, published in the *Journ. de Pharm.* t. xviii., p. 105.—*Ed. Pharm. Journ.*]

ON AIR BUBBLES FORMED IN WATER.

BY DR. TYNDALL.

He showed by a few simple experiments that water falling in a continuous column, which it always does for a certain distance, into another vessel of water, produces neither air bubbles nor sound—but that as soon as the distance is so increased as that the end of the column becomes broken into drops both air bubbles and sounds, varying from the hum of the cascade and of the ripple to the roar of the cataract and of the breaker, were produced. That the end of the column of issuing water, although it only seems to waver in consequence of a delusion arising from the effect of the rapid succession on the retina, was really composed of separate drops, the author said was proved by a very pretty experiment,—viz., by placing behind it a platina wire kept glowing by a galvanic battery. The continuous part of the wire was hidden; but the portion behind the wavering end he said became separated into dots of light and spaces hidden by the drops. He also showed that lateral motions of bodies in water, when rapid enough, caused both bubbles and sounds; and he accounted for their production in both cases by the surface closing over the pit formed by the descending drops or laterally moving body: the inclosed air is then carried forward, and at length ascending to the surface bursts with the explosion which causes the sounds.—*Report of British Association in the Athenæum*.

BROMPTON COUNTY COURT, *August 21.*
(*Before Andrew Amos, Esq., Judge, and a Jury.*)

**ACTION FOR RECOVERY OF FEES FOR CHEMICAL ANALYSES.
IMPLIED CONTRACTS.**

TAYLOR v. VICKERS.

MR. ROBERT BAKER, solicitor, stated the case on the part of the plaintiff. He said this action had been brought by Dr. Alfred Taylor, Professor of Chemistry at Guy's Hospital, against Mr. James Vickers, a dealer in and importer of Russian isinglass, for the recovery of a balance of £43 10s. from the defendant, for certain analyses undertaken by his order and for his benefit.

It appeared that during the year 1850, the defendant had reason to believe that his trade in isinglass was much injured by the sale of what he alleged was a spurious article; and he charged certain parties with selling a mixture of isinglass and gelatine as genuine Russian isinglass. In order to make out this charge, he applied to three Chemists, who reported on the alleged adulteration; but, for some reason or other, he wished to confirm or corroborate their views, and in December last, he consulted the plaintiff, and placed the matter in his hands, so that it might undergo a full investigation. The jury would hear from the plaintiff the nature of the instructions given; as he was informed, and as it appeared from a paper before him, no fewer than seventeen samples of isinglass and gelatine had been analysed by the plaintiff. Of these a minute analysis had been made of twelve samples, while the remaining five had undergone only a general chemical and microscopical examination. The analyses occupied a period of six or seven weeks—about three days a week being devoted to the necessary investigations; and during this period, as it will be shown by the evidence of plaintiff and his assistant, the defendant made frequent visits to the plaintiff's laboratory, approved of his proceedings, and suggested at different times various modifications of, and additions to the experiments. On two or three occasions, Mr. Devonshire, the defendant's solicitor, attended with the defendant, and from what was shown and explained to him by the plaintiff, he was enabled to draw up a statement for the opinion of counsel, which resulted in the advice that no legal proceedings could be taken by Mr. Vickers against his competitors in trade; and that so far as these analyses went, there was a want of evidence to establish, in a conclusive and satisfactory manner, the alleged fraud of adulterating isinglass with gelatine.

Full reports of the results of these chemical investigations were sent to the defendant on the 10th April. An account of the costs of the analysis was sent to him on the 21st May, in which, for various lengthy consultations with Mr. Vickers and his solicitor, a sum of £9 9s. was charged; and the seventeen samples of isinglass and gelatine were charged at the rate of *two guineas* per sample, making £35 14s. From the total £45 3s., a deduction had been made for isinglass supplied to the plaintiff, leaving the balance now sought to be recovered, as already stated, £43 10s. The defendant took no notice of the Reports or of the account, and it was not until the 18th June following, that in reply to a letter addressed to him by the plaintiff, he stated that he must consider how far he was responsible for the whole amount charged, and that he had authorized the analysis of *three* samples only. Proceedings were then taken to recover the amount. The defendant had met them by paying twenty guineas into court, and it would be for the jury to decide whether that was a proper and satisfactory remuneration to the plaintiff for the services which he had rendered to the defendant.

Alfred Swaine Taylor deposed that he was Professor of Chemistry at Guy's Hospital, and that he had been so for a period of twenty years. He knew the defendant, who called on him shortly before the 10th December last, in reference to an analysis of two samples of isinglass which witness had then recently made for Messrs. Dakin of St. Paul's Churchyard. The defendant stated that one of the samples, on which a favourable report had been given by witness, was a sample of his Russian isinglass. He further said he wished to have a more extended investigation made, especially in reference to the adulteration of isinglass with gelatine, and that a Mr. Berkeley would deliver to witness two samples, procured from well-known dealers, for an analysis and report. Defendant met witness by appointment at the Chemical Laboratory, Guy's Hospital, on the 10th December, when the defendant brought with him

numerous samples of isinglass (Russian and Brazilian), in the cut and uncut state. Some experiments were performed with these at the time, and a comparison made with the two samples analyzed for Messrs. Dakin; but defendant then gave no order regarding their special analysis. On the 14th December, two samples were delivered by Mr. Berkeley to witness for analysis, according to defendant's order, and subsequently a third sample. When the analysis of these three samples was nearly completed, defendant met witness, and then stated that he wished the different chemical processes performed on the three samples to be performed on those brought on the 10th December, as well as on two samples of gelatine. The weight of ash, and the nature of the ash in each case, formed part of the analysis, and defendant saw and compared some of the ashes. He witnessed either the experiments, or the results of the experiment, on each sample, and at this time took no objection to the proceedings. Subsequently, five other samples of isinglass were adulterated with various percentages of gelatine, by the advice of defendant's solicitor, and then were examined chemically and microscopically by witness. Mr. Devonshire, the defendant's solicitor, examined them by witness's microscope in his presence, and it was through this examination, as witness believes, that the solicitor was enabled to draw up a correct statement for the opinion of counsel. The witness then, in answer to questions put by the Court, described the differences between isinglass and gelatine, and the various steps of the analysis which he had made.

In cross-examination, he stated that the analysis for Messrs. Dakin was not so minute as that required by the defendant; that the experiments on the samples made on the 10th December were not charged in his analyses, which were separate and distinct; that he did not know why the numerous samples of the 10th December were brought to him by the defendant, if not for analysis; that the order for this analysis was not given until after the two samples had been examined, and the evidence of adulteration was not so conclusive as the defendant supposed; that during the seven weeks, the defendant had paid him frequent visits at the laboratory, and although he knew he was occupying his time in the analysis of the samples of the 10th December, he did not offer to stop him, and he saw that several of these samples were entirely used in experiments, some of which the defendant had himself suggested.

Thomas Andrews stated that he had been chemical assistant to the preceding witness for a period of twenty years. Remembered the defendant coming to the laboratory some time in December last, and giving orders concerning the analysis of numerous samples of isinglass; that he, by the request of the defendant, had weighed out quantities and assisted plaintiff in performing experiments with the whole of these samples; that plaintiff was always at the hospital three times a week for about six or seven weeks, and frequently four times; that he was engaged almost exclusively in this analysis, coming about nine o'clock in the morning, and with the exception of the hour occupied by the lecture, working at these experiments until four o'clock or later; sometimes until it was impossible to see. The defendant frequently came to see the results; and on two or more occasions he came with his solicitor. The consultations sometimes occupied three or four hours; and witness twice received from defendant half-a-crown for the trouble which he had given him in the experiments performed at these consultations.

Arthur Aikin had been associated with plaintiff, as joint professor of Chemistry at Guy's Hospital, for a period of twenty years. He remembers defendant making several visits to the laboratory in December and January last. He was in consultation with plaintiff on these occasions, and the investigations were directed exclusively to the analysis of isinglass. Witness was consulted on several occasions by both parties, and he gave his opinion when asked. Saw a large number of samples under examination, and has no doubt they were examined for the defendant, as he was frequently there, and the results of the experiments were sometimes shown and explained to him in witness's presence. Has seen the notes of analysis, and the account of fees on the amount of which he was consulted by the plaintiff at the time of drawing up the account. Thinks the charges fair and just, and that the analyses, in a practical view, were of a useful kind.

William Thomas Brande deposed, that he had examined the tabulated results of the plaintiff's analyses, and had also seen the account. In his opinion, considering the standing of the plaintiff, the charge of two guineas per sample was exceedingly reasonable. He had been employed with plaintiff in various analyses. The fee received by scientific Chemists was usually five guineas a day. The analyses were

such as would be likely to be required by a dealer in isinglass, and were, in his judgment, necessary and proper.

John Thomas Cooper has been a practical Chemist for twenty years, and frequently engaged with Dr. Taylor in chemical analysis. Has seen the notes of the analyses and the account; thinks the charges exceedingly reasonable: if the plaintiff had employed him he should have made a much higher charge for the same amount of work.

James Vickers, the defendant, was called by the plaintiff. He admitted that several letters produced were in his handwriting.

This was the case for the plaintiff.

The defendant, after directing the attention of the jury to some points in contradiction of the evidence for the plaintiff, which, however, he admitted were not very material, asserted that he had not authorized the plaintiff to analyse more than the three samples handed to him by Mr. Berkeley. For these three he held himself to be responsible, and he had accordingly paid twenty guineas into court, which he thought sufficient to cover the fair and reasonable charge for the analysis. The remaining samples which had been analyzed by the plaintiff had been analyzed for his (plaintiff's) own information and instruction, in order that he might become acquainted with the differences among the commercial varieties of isinglass known in the market, and he contended that he could not be fairly made chargeable with these supplemental analyses.

A letter was then produced and read, in which the defendant admitted he had written to plaintiff to "persist in the analysis" of three of the samples in dispute, especially to compare one (that marked Levy) with Brazilian isinglass; but he considered that this was to add to and perfect the analyses which plaintiff had already performed for Messrs. Dakin, and not for his (defendant's) benefit.

In cross-examination he admitted that he had received a special report on this sample, as also on all the other samples in dispute. He had witnessed some of the experiments, and had had all the results fully explained to him, but still he contended he had ordered only three samples to be analyzed, and could fairly be charged only with the analysis of three. He admitted having received full reports of results on the samples which he had ordered, as well as on those which he had not ordered; this was on the 10th April last. He made no objection to the extent of these reports at the time, but the account of fees did not accompany them, or he should have returned it to plaintiff in a few hours. He received the account of fees on the 21st May; and the first time at which he made any objection to the account was in a letter written to plaintiff on the 18th June, a month afterwards. He did not make an earlier objection, because he required time to consult friends. The letter which he wrote was in reply to an application for payment by the plaintiff.

Mr. Devonshire, the solicitor for the defence, recommended the jury, as the statements of plaintiff and defendant were in some respects conflicting, to discard their testimony altogether, and then there would be, on the part of the other witnesses, an entire want of evidence in support of this claim. He contended that there was no proof whatever that defendant had ordered the analysis of more than three samples, and as he had paid twenty guineas into court, there was an ample remuneration for the services actually rendered.

The Judge directed the Jury that the issues which they had to try were three in number, and of a very simple kind:—1. Were these analyses likely to be at all necessary or serviceable to the defendant; 2. Were they ordered by him; and 3. Were the charges just and recoverable—such as would be made by one occupying the position of the plaintiff as a scientific Chemist? On the first and last points they had had the opinions of some of the most eminent Chemists in Europe; and these gentlemen were unanimous in thinking that the charges were even lower than those which they themselves would have made. As to the second question, the Jury must know that a written contract is not necessarily required for services of this kind: there may be an implied contract, as where a man leaves or sends samples for analysis, where he attends frequently to see results, and suggests various modifications. Under such circumstances it would be for them to consider whether there was not sufficient evidence of an implied order for the analysis on the part of the defendant; and whether it was likely a gentleman in the plaintiff's position would occupy himself for twenty days in these numerous researches on isinglass merely for his own amusement and information? Then, again, the defendant had made no objection to the report which he admitted he received on the 10th April; but he said he had not then had the account, or he would have returned it in a few hours,

with his objections. However, it appears by his own admission, he had the account a month in his possession before making any objection to it; and it did not appear that he would then, or at any time, have made his objection, but for the fact that he had been applied to for payment. The defendant said that he had fully satisfied the plaintiff's demand by paying twenty guineas into court. The jury would say, in looking to the whole of the evidence, including the statements of plaintiff and defendant, whether that sum was, in their judgment, a reasonable and fair remuneration for the scientific services of the plaintiff.

The jury retired to deliberate for about a quarter of an hour, and then returned a verdict for the plaintiff for the full amount claimed.

The Judge was applied to respecting special fees to the scientific witnesses, who had attended at much trouble and loss of valuable time to give evidence. He said the fees were fixed by law and he could make no alteration in them, or, under the circumstances of this case, he would certainly have granted the fullest allowance. The defendant would pay the legal costs.—*Medical Gazette*.

On September the 17th, the defendant's solicitor, Mr. Devonshire, moved in the same court for a new trial, on the ground that the verdict was against evidence, but the Judge refused the application.

REVIEWS.

THE LIFE OF THE HON. HENRY CAVENDISH; including Abstracts of his more important Scientific Papers, and a Critical Inquiry into the Claims of all the alleged Discoverers of the Composition of Water. By GEORGE WILSON, M.D., F.R.S.E., Lecturer on Chemistry, Edinburgh. London: printed for the Cavendish Society.

As stated in the Preface, "this volume consists essentially of three distinct portions. The first, a bibliographical narrative; the second, abstracts of scientific papers; the third, a criticism of the asserted merits of all the claimants of the discovery of the composition of water."

The family of Henry Cavendish are supposed to derive their origin from a period anterior to the Conquest, and trace their pedigree by unbroken links to Sir John Cavendish, Lord Chief Justice of the King's Bench in the time of Edward III. Henry Cavendish was born in Italy on the 10th of October, 1781. He matriculated at Cambridge, but did not graduate. In early life he was attached to Chemistry and other scientific pursuits. He joined the Royal Society in 1760, and his first paper (on factitious airs) appeared in the Transactions in 1766.

Reserve and love of retirement were his characteristic peculiarities, and but little is known of his personal history during several years after he left college. It is supposed that at that period his income was limited, which, coupled with his predilection for mathematical and physical studies, encouraged his retired habits.

Although he afterwards became possessed of much wealth, this did not divert him from his scientific pursuits, while it enabled him more fully to carry on his experiments. The work before us contains some curious anecdotes illustrative of his indifference about money, aversion to society, and various eccentricities. Cavendish was no less distinguished as a natural philosopher than he was as a Chemist, but it is chiefly in the latter capacity that he is now under notice. His earliest researches in chemistry were directed to the examination of "fixed air." He also investigated and described the properties of hydrogen, nitrogen, and oxygen,



HON. HENRY CAVENDISH.

although not under these names. He examined the water of a spring in Rathbone Place in 1767, and his paper on the subject appears in the *Transactions of the Royal Society* of that year. In 1771 he published an elaborate paper on Electricity, and in 1776 an account of his "Attempts to imitate the Effects of the Torpedo." In 1778 he commenced a series of experiments, which resulted in the discovery of the constant quantitative composition of the atmosphere, the compound nature of water, and the composition of nitric acid. His first paper relating to this investigation was entitled "An Account of a new Eudiometer," and was published in 1783. This instrument was a contrivance for measuring the amount of diminution in the volume of air occasioned by the combustion in it of so-called phlogisticating agents. He found that the dephlogisticated portion (the oxygen) was equivalent, in round numbers, to one-fifth of the original volume of the air. During these experiments he repeatedly detonated hydrogen (which he called inflammable air, or phlogiston) with atmospheric air by means of the electric spark, and observed that this operation was always followed by the deposition of moisture, a circumstance to which his attention had been drawn by Dr. Priestley and Mr. Warltire early in 1781. By numerous experiments in varied proportions he ascertained the ratio in which, after explosion in a shut vessel, the air was found diminished one-fifth, whilst the residual air was free from oxygen and possessed the properties of nitrogen. He varied the experiment by substituting oxygen for atmospheric air. In place of the oxygen and a volume twice as great of hydrogen, which had been burned with it, he found a certain amount of liquid, which, on examination, he observed, "seemed pure water," and came to the conclusion "that this dew is plain water, and consequently that almost all the inflammable air, and about one-fifth of the common air, are turned into pure water," and "that water consists of dephlogisticated air united with phlogiston." But he also observed, that when atmospheric air was used in excess the water was acid, which observation led to another series of experiments, resulting in the discovery of the composition of nitric acid, which Dr. Black states to have been "one of the most important in the whole science of Chemistry." The final report of this series of investigations was published in 1788, which was his last paper on Chemistry. His remaining published works relate to Meteorology and Astronomy, including papers on the height of an Aurora seen in 1784; a method for reducing lunar distances; an inquiry into the density of the earth, and an improvement in the manner of dividing astronomical instruments.

THE WATER CONTROVERSY constitutes the most prominent feature in the work before us, and therefore merits a brief notice. Early in the year 1781, Dr. Priestley was trying a "random experiment," which consisted in exploding, as suggested by Volta, a mixture of common air or oxygen, with hydrogen, in a close vessel, by the electric spark, and Warltire who was present, observed the deposition of moisture. Priestley interpreted this phenomenon as a confirmation of his theory that water was present in all gases, and Warltire pursued the investigation as a means of demonstrating the ponderability of heat. The circumstance was communicated to Cavendish, who was at that time engaged in investigating the changes air underwent by the combustion of various bodies, hydrogen among others, in confined portions of it till they were extinguished. He repeated the experiment, but could not confirm Warltire's conclusion that there was a loss of weight. On the contrary, he discovered by a series of careful experiments, varying the proportions of the ingredients, that the weight of the liquid produced was equal to that of the gases which had disappeared. Hence he inferred as before stated, that the gases had been converted into the fluid, which on examination appeared to be pure water. Cavendish was never hasty in publishing, and he continued his researches. At some period before March 26th, 1783, he communicated his results to Dr. Priestley. Dr. Blagden (who was assistant to Cavendish) reported them before June 24th of the same year, to Lavoisier in Paris, who, in conjunction with Laplace, repeated the experiments, and, on the following day, announced the discovery at the French Academy, professing to be the first who had observed the identity in weight between the mixed gases and the water produced. In the meantime, Dr. Priestley not appreciating the discovery, reported the researches of Cavendish to Watt, who, in reply, wrote a letter, stating the conclusion deducible from the experiments. This letter was intended as a sequel to a paper by Priestley, which was to be read at the Royal Society, in April, 1783; but some of the inferences in Priestley's paper having been found to be fallacious, Watt requested that his letter might be withheld.

Cavendish published the result of his researches in 1784; and Watt, having been informed by De Luc that his views respecting the composition of water were con-

firmed by Cavendish, without reference to him as the discoverer, demanded that his letter of the previous year to Dr. Priestley, should be read to establish his claim to priority. De Luc, without duly informing himself as to the experiments of Cavendish in 1781, acquired the title of the mischief-maker by his interference as the defender of Lavoisier, and even went so far as to insinuate unfair dealing on the part of Cavendish. While this controversy was in progress, and kept up with more zeal by the respective friends than by the rivals themselves, the accuracy of the alleged discovery was not universally acknowledged, and as late as 1788, Dr. Priestley wrote a paper for the purpose of showing the fallacy of Lavoisier's experiments, and proving that Cavendish and Watt had arrived at erroneous conclusions. The intricacy of the controversy was much increased by the confusion in nomenclature, arising from the phlogiston theory in which Cavendish, Watt, and Priestley were believers, while Lavoisier adopted other views on this subject.

After some years of subsidence, the water controversy was revived in 1838, by the publication of the *Eloge* of Watt, read by Arago at the Academy of Sciences in Paris, in which the claims of Cavendish were disputed. The Rev. M. V. Harcourt replied in defence of Cavendish, and introduced the subject in his Address to the British Association for the Advancement of Science, in 1839.

Lord Brougham, Lord Jeffery, Dumas, Berzelius, Sir David Brewster, Dr. Whewell, Mr. Weld, Mr. Muirhead, and several others, entered into this dispute; unpublished papers and correspondence were raked up, and the discussion was characterized by a warmth of party spirit by no means conducive to an impartial decision. A condensed recital of the arguments and discussions on all sides is voluminous and wearisome. The interest in the discovery itself is lost in the excitement produced by the question of paternity, and the three philosophers are reduced to the level of claimants disputing about a patent.

Merit is unquestionably due to each of the three rivals in the water controversy, but the evidence before us proves beyond a doubt, that Cavendish was the original discoverer, and that the report of his experiments, which was furnished through different channels to Watt and Lavoisier, gave them the clue by means of which they anticipated him in the publication. Another great merit belongs to Cavendish, which is, that he was the party who appeared to take the least interest in the discussion, his mind being engaged in the pursuit of science rather than fame.

The book is well written. There is unavoidably some repetition on account of the arrangement, which occasions the necessity of mentioning some incidents in three places. The biography and the abstracts of scientific papers are exceedingly interesting and instructive. The water controversy is a heavy subject, not so likely to interest the general reader. The author has dealt with it in a fair spirit, and with an evident desire to do justice to all parties.

The portrait of Cavendish is taken from a sketch which is preserved in the British Museum. The original was taken by stealth, as Cavendish would never consent to sit for his portrait.

THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA. *By authority of the National Medical Convention, held at Washington, A.D. 1850.* Philadelphia: Lippincott, Grambo, and Co. 1851.

AFTER the long and tedious delay which attended the preparation of the present London Pharmacopœia, the publication of the work before us, at the expiration of twelve months from the appointment of the Committee, to whom revision and publication were entrusted, offers a marked contrast, indicating a characteristic feature in the habits of our transatlantic brethren. The revision of the United States Pharmacopœia takes place every ten years; and this duty, together with that of preparing and publishing the new work, is committed to a National Medical Convention, consisting of delegates from all the incorporated Medical and Pharmaceutical bodies in the United States. One year prior to that in which the new publication is to be prepared, a requisition is sent to the several incorporated State Medical Societies, the incorporated Medical Colleges, the incorporated Colleges of Physicians and Surgeons, and the incorporated Colleges of Pharmacy, throughout the United States, to elect a number of delegates, not exceeding three, to attend a General Convention, to be held at Washington in the following year. The several incorporated bodies are, at the same time, requested to submit the Pharmacopœia to a careful revision, and to transmit the result of their labours, through their delegates or otherwise, to the Convention.

The Convention, at their meeting, after receiving such suggestions and communications as may be sent them, and deciding any points of a general nature, refer the final work of revision to a Committee of nine Members, who are authorized to publish the work after its revision, and to take all other measures which may be deemed necessary to carry out the views and intentions of the Convention.

The last Convention, from which the present work originates, met on the 6th of May, 1850. One of the questions which occupied their attention related to the publication of the Pharmacopœia in Latin as well as English; but after fully discussing the proposition which had been made to this effect, it was negatived by an unanimous vote.

The Committee, who commenced their duties on the 26th of May, 1850, appear to have carried out the objects proposed with much judgment, the changes being mostly for the better.

In the general features of the work it bears a close resemblance to an English edition of the London Pharmacopœia; and the Committee, in their Preface, anticipating a reference to this circumstance, offer the following very sensible explanation:—

“To one familiar with the British Pharmacopœias it will be obvious, that in the preparation of our own, many of the processes have been taken from them with little alteration. This has been done advisedly. It is of the highest importance that medicines having the same names should have the same composition; and as British works on medicine are much read in this country, it would lead to never-ending confusion if the substances they refer to by name should differ materially from those known by similar names with us. It has therefore been a general aim to bring our Pharmacy into as near a correspondence as possible with that of Great Britain; but in all cases in which greater purity or efficiency in the medicine, or greater convenience and economy in the process, or any peculiarity in the relation of the preparation to our own circumstances and wants, called for deviation from the British standards, modified or wholly original processes have been adopted.”

TO CORRESPONDENTS.

Minimus, in allusion to our reply of last month to the effect that “when drops are ordered in a prescription, drops, and not minims, should be used,” observes, that the terms are used as synonymous by some medical men. He believes that 99 out of 100 if asked what they meant by a drop, would reply a minim. We do not think such ignorance prevails in the profession. Every medical man knows, or ought to know, that a drop is a very uncertain quantity, and in some liquids about half a minim. We maintain that it is the duty of the Chemist to dispense according to instructions given. If a medical man orders one thing when he means another, the Chemist is not responsible, unless a dangerous dose is ordered by mistake, in which case he should inquire what was intended.

J. M. (Buckingham).—We are not aware of any researches on the artificial production of the diamond since the report in our number for July, 1850.

E. F. (Barking) calls our attention to a report in the *Times* of Sept. 10, of a case of attempted suicide by oxalic acid, and the statement of Mr. A. Beckett, “that an act was now in operation making it a punishable offence for any person to sell poison under certain restrictions; and that if it was purchased by any person under age the seller was liable to a penalty of £20.” This was an error, there is no such law except in relation to arsenic.

W. K. (Horncastle) has sent the following reply to an advertisement “as one of many proofs of the need there is of a reformation in the present state of knowledge possessed by some of those who occupy the position of Chemists’ Assistants.” The letter is authenticated, but we omit the name:—

“Sir

“I saw yours vacancy for wanting a Junior assistant who as serve part of is time in the Druggest Buisness I have serve of my time in and Wholesale and &c. Druggest and is wanting a situation I have serve 3 years in the Buisness my age 17 years and my salary £15 per year.

“Sir, I remains yours”

“Hull August 4th

J. B. B. (Ottley) suggests the propriety of prohibiting the admission of Chemists who deal in homœopathic globules into the Pharmaceutical Society.

Mr. Walker (Maidenhead) objects to the plan of writing a private mark on prescriptions denoting the price, and thinks it would be better to write the price in plain figures to ensure uniformity in the charge.—This plan would not answer the object in view; an unscrupulous patient would alter the price, and an underselling Druggist would adopt as his motto "twopence less."

M. P. S. from the Beginning (Manchester).—The question is fully answered in vol. iv., page 245.

B. B.—(1.) Gregory's powder requires a stamp if sold with a recommendation and directions.—(2.) PENNYROYAL AND HYSTERIC WATER—

R Aquæ Bryonias comp. pt. j.

Aquæ Pulegii pt. ii. Misce.

AQUA BRYONIE COMP. *R* White bryony root, 3lb.; valerian, 12oz.; pennyroyal, rue (dry) of each 1½lb.; mugwort, 1½lb.; feverfew, ½lb.; orange-peel, 6oz.; lovage roots, 1lb.; basil, catmint, of each 3 bundles; rectified spirit, 3 gals.; water, 9 gals.; distil 6 gallons.

An Associate (W. Hampton).—PILULA BENEDICTA. *R* Aloes ½oz.; senna, 2drs.; assafœtida, galbanum, myrrh, of each, 1 dr.; sulphate of iron, 6 drs.; saffron, ½ dr.; mace, ½ dr.; oil of amber, 40 drops; syrup of mugwort, q. s. Dose 20 gra.

A. G. P. (Havant).—(1.) Yes.—(2.) We have no formula for Ung. colchici.

F. H. (Amersham).—HORTICULTURAL INK for zinc labels:—Chloride of platinum, 5 grs., distilled water, 1 oz.; dissolve.

P. P.—See vol. x. of this Journal.

M. P. S.—We have not seen the work.

J. H.—Robinson's *Dental Surgery*.

N. M. P. S.—Yes.

R. J. W. O.—The numbers are empirical, and the rule is only proposed as a means of getting an approximative result.

H. W.—Pyrogallic acid is prepared by heating gallic or tannic acid in a retort or other suitable vessel, when the pyrogallic acid sublimes into the cool part of the apparatus. Gallo-nitrate of silver is made by mixing a solution of nitrate of silver, containing acetic acid with a solution of gallic acid. Bronze powder, suitable for the purpose stated, is sold at the oil-shops.

Esculapius.—We have no recipe for essence of shrimps.

Alpha.—The process has been described in a former number of this Journal.

Adolescens.—The precipitate was most likely caused by the gentian.

A Registered Apprentice (Cambridge).—(1.) The work is considerably enlarged, and therefore more expensive than the former edition.—(2.) The particulars were forwarded. Further information would be given by Mr. Smith, 17, Bloomsbury Square.

Alpha.—(1.) Application should be made to Mr. Smith, 17, Bloomsbury Square.—(2.) Lindley's *School Botany*.

A Correspondent in Dublin has sent us a letter, pointing out an inconsistency in another Journal, which we think not suitable for us to publish.

Pharmacien (South Shields), states, that in his locality, "nine-tenths of the shop-keepers are retailers of drugs and dispensers of poisons, to the imminent peril of the public health," and thinks the registration of all Chemists and Druggists would tend to check the evil.

THE PATENT MEDICINE LICENCE.—Those who have not taken out a patent medicine licence are in danger after the 1st of October.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements to Mr. CHURCHILL, Princes Street, Soho.
Other Communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. V.—NOVEMBER 1st, 1851.

THE PHARMACEUTICAL MEETINGS.

THE first of these Meetings for the season will be held on Wednesday evening, the 12th of November. Last season the Meetings were kept up with unusual spirit. The attendance was remarkably good, and there was no deficiency of subjects for discussion. At the next Meeting, on the 12th instant, the prizes awarded by the Professors at the close of the last session of the School of Pharmacy, will be presented to the successful candidates.

Numerous contributions to the Museum from the Great Exhibition will be on the table. Among these we may mention the interesting and unique collection of barks and their products, presented to the Society by Messrs. Howards and Kent. Also a selection from the specimens from British Guiana, presented on behalf of the exhibitors by Mr. Ridgway.

Although the programme for the evening is not quite complete, we are enabled to announce to our readers that the materials in hand are amply sufficient to ensure an instructive Meeting.

THE PROPOSED BOARD OF EXAMINERS FOR SCOTLAND.

IN our notice last month of a Meeting held in Edinburgh to consider this subject, we omitted to publish the Resolutions, in the hope that the official Report of the Council would have appeared in this number. The Council, however, considering the subject too important to be hastily decided, adjourned it until the meeting in November. In the mean time the subjoined Resolutions have been circulated in Scotland by the local Secretary for Edinburgh, in order to give the parties more immediately concerned an opportunity of considering the proposed arrangement. We omit the sixth Resolution, containing the names of those who were recommended for appointment as Examiners to act until the General Meeting in 1852.

1. That the number of Examiners for Scotland shall be Eight, exclusive of the President and Vice-President of the Society, who shall be Members of the Board, *ex-officio*.

2. The Examiners shall be nominated Annually, at a General Meeting of the Members of the Pharmaceutical Society resident in Scotland, to be summoned by circular, advertisement, or both—ten days' notice being given. The Meeting to be held in Edinburgh, and to take place on the First Monday in May.

3. The Names of those who are so nominated, shall be transmitted to the Council for approval and appointment.

4. The Board shall sit in Edinburgh four times in the year, or as often as may be required.

5. The Names of Candidates who have passed the several Examinations, shall be transmitted to the Council for Election as Members or Associates, and for publication in the Transactions.

THE CLOSE OF THE GREAT EXHIBITION.

THE demise of the Great Exhibition took place on Saturday, the 11th of October. On the 13th and 14th it was "lying in state," accessible only to Commissioners, Exhibitors, and other officials, with a limited number of friends. On Wednesday, the 15th, the last obsequies were performed. The day, as well as the ceremony, was suited to the occasion. The rain was incessant, and for several hours in the morning a regular procession of carriages continued to advance at funeral pace to the centre of attraction. Many hundreds walked through the mud and rain, and the appearance and expression of the company exhibited a striking contrast to the cheerful assembly at the opening ceremony on the 1st of May.

At 12 o'clock H. R. H. Prince Albert and the Royal Commissioners, accompanied by the Bishop of London, ascended the temporary platform erected for

the occasion in the centre of the building, while a choir, formed by the Sacred Harmonic Society, performed the first verse of the National Anthem. Viscount Canning then read an address, giving a brief account of the regulations adopted, and handing to the Prince the reports of the juries: to which his Royal Highness returned a very appropriate reply. The choir then performed the second verse of the National Anthem, after which the Bishop of London offered up a prayer of thanksgiving. The Hallelujah Chorus terminated the ceremony. The company immediately began to disperse, and the sound of hammers denoted the active removal of platforms and barriers preparatory to the general dispersion of the contents of the building. This will be rapidly accomplished, and in a few weeks nothing will be left but the shell.

On looking back at the history of this undertaking, the short space of time in which the whole has been accomplished, the nature of the building and its contents, the interest excited, the immense number of visitors, and the amount of the receipts, it cannot be doubted that the most sanguine expectations of the Executive have been more than realized. It is true that the objects exhibited might have been more uniformly excellent in quality, and that a greater amount of originality of design might have been displayed, if all the leading men in each class had, in the first instance, thrown their weight into the scale. Some, however, were opposed to the project, and others came late in the field. This sufficiently explains the cause of the mediocrity of some of the articles admitted, and the absence of some which might have given increased interest to the Exhibition. Notwithstanding this circumstance—unavoidable in an undertaking so novel and comprehensive in its design—the collection as a whole was such as to satisfy all reasonable minds, and to leave a lasting impression on those who had an opportunity of appreciating its merits.

THE DISTRIBUTION OF PRIZES

was, in our opinion, a mistake, and the only part of the arrangements calculated to cast a shade over the general cheerfulness of the retrospect. The labours of the jurors were extremely onerous, and attended with many difficulties. The regulations were maturely considered and every precaution was taken to ensure impartiality and justice to all parties. Yet among so vast an accumulation of materials in each class, derived from different nations and distributed in various parts of the building, it would be presumption in any jury to assert that in no instance merit has been overlooked, or reward withheld which might fairly have been given. Still less could a jury expect to fulfil the expectations of all aspirants, each of whom naturally feels a peculiar interest, if not prejudice, in his own productions.

An additional source of difficulty is explained in the following extract from the report of Viscount Canning:—

“The Council of Chairmen, in proceeding to the discharge of their duties, were met at the outset by a serious difficulty. Her Majesty’s Commissioners had expressed themselves desirous that merit should be awarded wherever it presented itself, but anxious at the same time to avoid the recognition of competition between individual exhibitors. They had also decided that the prizes should consist in three medals of different sizes: and that these should be awarded, not as first, second, and third in degree for the same class of subjects and merit, but as marking merit of different kinds and character.

“The Council of Chairmen found, to their regret, that it would be impossible to lay down any rules for the awarding of the three medals, by which the appearance at least of denoting different degrees of success amongst exhibitors in the same branch of production could be avoided. Accordingly, after fully explaining their difficulty to Her Majesty’s Commissioners, they requested, as a course by which it might be materially diminished, that one of the medals might be withdrawn.

“Of the remaining two, they suggested that one, the prize medal, should be conferred wherever a certain standard of excellence in production or workmanship had been attained—utility, beauty, cheapness, adaptation to particular markets, and other elements of merit being taken into consideration according to the nature of the object; and they recommended that this medal should be awarded by the juries subject to confirmation by the groups.*

* Each group consisting of such juries as had to deal with subjects in some degree of kindred nature.

"In regard to the other and large medal, they suggested that the conditions of its award should be some important novelty of invention or application, either in material, or processes of manufacture, or originality combined with great beauty of design; but that it should not be conferred for excellence of production or workmanship alone, however eminent; and they further suggested that this medal should be awarded by the Council of Chairmen, upon the recommendation of a jury, supported by its group."

Admitting the force of the argument here advanced, so far as relates to some cases, we think that in others a greater evil was incurred to avoid a smaller. It might be undesirable to make a distinction by first, second, and third class medals, between certain articles of manufacture, where such distinction might make the fortune of one individual, at the expense of another nearly his equal in merit. This might have been avoided by the juries themselves, who could at discretion award equal medals for the same class of products. But the evil incurred was that of giving the same medal for objects or collections of objects, so entirely disproportioned in the amount of merit, that the value of the prize in one instance, was neutralized by the comparative insignificance of the objects in the other; and the only means by which a jury could avoid this apparent injustice, was, by withholding the medal altogether from many exhibitors quite deserving of rewards, although not on a par with others to whom the prize medal had been awarded. A general rule was laid down, that in cases of doubt in the award of the prize medal, the decision should be in favour of the exhibitor—in the award of the large or Council medal, an opposite principle was adopted. Consequently, the Council medal, of which only 170 were given, is an unquestionable mark of distinction. It must, however, be borne in mind, that the two medals represent different kinds of merit, not different degrees of the same kind of merit. — Of the prize or jury medals, 2918 were awarded; and among the recipients, there are many whose contributions were of a very elaborate and expensive nature, the result of great skill and industry denoting merit equal in degree to that of the recipients of the Council medal, although wanting the attribute of novelty of invention. Again, many Exhibitors were unavoidably passed over entirely, or with merely honourable mention, who would have been entitled to a third or fourth class medal if the sliding scale had been adopted.

A separate design has been executed for a medal to be given to each Exhibitor, a compliment well intended although superfluous. As a distinction, it will be of no value, the same medal being given to the Exhibitor of a steam-engine, a quack medicine, a steel pen, or a button. As a reminiscence, such a medal was needless, as medals for this purpose could be bought outside the building, at a price ranging from 1*d.* to 6*d.*

THE DESTINATION OF THE CONTENTS OF THE GREAT EXHIBITION.

THE Royal Commissioners have made laudable exertions to secure for the benefit of the public some of the most interesting specimens in the Exhibition, more especially those which illustrate the arts and manufactures. A circular has been transmitted to the exhibitors, intimating that the Royal Commissioners would be glad to receive contributions to be appropriated in such manner as might appear desirable, in order to prevent the entire dispersion of the most interesting series of illustrations which was ever collected. It having been determined that the building is to be removed, it is not intended to establish a new Museum for the display of all the specimens which may be offered by the exhibitors, but the managers of the several museums already existing have been active in the endeavour to secure those contributions which are respectively appropriate, and we have been informed that the Royal Commissioners have seconded these efforts.

THE BRITISH MUSEUM has a national claim for a share of the spoil; and this establishment affords a focus for the reception of a great variety of objects illustrative of natural history, antiquity, the arts, manufactures, &c.

THE MUSEUM OF THE CHEMICAL SOCIETY, which has lately been located in Cavendish Square, will receive many valuable contributions, the Council having been for some time past engaged in a systematic communication with exhibitors in the chemical department, which has been attended with much success. The special object of this Museum is the exhibition of products illustrating abstract chemical science.

THE MUSEUM OF ECONOMIC GEOLOGY has for its primary object the illustration of metallurgical and mining operations generally, and geological formations, as well as building materials, fossil remains, minerals, ores, and the various products used in the arts or manufactures.

THE MUSEUM AT KEW GARDENS, which has only been a few years in existence, has recently been enlarged by the addition of two wings, equal in size to the centre compartment. Among other contributions to this Museum, we may mention the valuable and interesting collection of vegetable specimens exhibited by Messrs. Lawson and Sons, Edinburgh, namely the vegetable products of Scotland, comprehending substances used for food, in the chemical arts, in medicine, in manufactures, and in house and ship-building. This is a very extensive collection, and quite in accordance with the purpose of the Museum at Kew, which is, to exhibit in one establishment the growing plants and the various products, with their applications to the arts, commerce, manufactures, &c. For example, the gardens contain flax, varieties of corn, the *ricinus communis*, the trees used for various purposes. In the Museum are textile fabrics, specimens of corn, castor-seeds and oil, and samples of wood in the state in which it is employed for ship-building and other purposes. It is intended in this manner to furnish illustrations of vegetable products generally in an institution containing facilities for exhibiting in the living state the plants or trees from which these products are obtained. This is an undertaking never before attempted in this country, and which deserves especial encouragement.

THE MUSEUM OF THE PHARMACEUTICAL SOCIETY will not be neglected in the general distribution. The contributions of several Exhibitors, including some of the specimens exhibited by the London Druggists, have been, or are likely to be presented to the Pharmaceutical Society. The most important contribution is Messrs. Howards and Kent's valuable collection of barks and their products, which we have described in a previous number of this Journal (vol. ix., p. 14.) These, with the glass case in which they are contained, have been presented by Messrs. Howards and Kent to the Pharmaceutical Society. The Museum of this Society ought to contain every variety of substance, animal, vegetable, and mineral, which relates directly or indirectly to Pharmacy. It is already furnished with specimens of chemical products and *materia medica* in ordinary use, some of which are remarkable for their quality or the history attached to them, and by the united efforts and liberality of the Members, it is likely to become the most complete Museum of the kind in Europe.

THE PROTECTION OF INVENTORS.

EARLY in last session an Act was passed called "The Design's Act Extension Act, for the Protection of Persons desirous of exhibiting new Inventions in the Exhibition of the Works of Industry of all Nations." This protection was limited to the year 1851, in anticipation of a Patent Law Amendment Act, which was in contemplation, and which was intended to rectify the existing defects in this branch of legislation.

The latter measure was introduced and passed in the House of Lords, and was sent down to the Commons on the 4th of July; but so large a proportion of the session was wasted in ecclesiastical disputes, that this Bill was deferred until nearly the close, and was so mutilated in committee, that on its return to the Upper House the Lords did not recognize in it their own offspring, and accordingly threw it out.

The Bill, both in its original and in its altered state, contained some objectionable provisions which we need not particularize, but it contained one important improvement on the present system which we briefly notice, as it is likely to

be brought forward during the next session of Parliament: we allude to the apportionment of the fees. According to the present law the entire amount is payable on the granting of the patent. Consequently an inventor, in order to secure himself against piracy, is obliged to incur a very heavy expense, in many instances, before the value of his invention has been ascertained. The act of submitting it to the test of experience invalidates his claim, and the inevitable result is an enormous waste of money invested in patents which prove on trial to be worthless. Without going into a detailed explanation, the nature of the proposed improvement may be sufficiently understood from the following scale of fees for a patent for the United Kingdom :—

	£	s.	d.
On leaving petition for grant of letters patent.....	5	0	0
On notice of intention to proceed with application.....	5	0	0
On sealing of letters patent.....	5	0	0
On filing specification	5	0	0
At or before the expiration of the third year	40	0	0
At or before the expiration of the seventh year	80	0	0
On extension of period of provisional protection	10	0	0
On leaving objections to granting of letters patent.....	2	0	0
Every search or inspection	0	1	0
Entry of assignment or licence	0	5	0
Certificate of assignment or licence	0	5	0
Filing application for disclaimer.....	5	0	0
Caveat against disclaimer	2	0	0

STAMP DUTIES TO BE PAID.

On warrant of law officer for letters patent	5	0	0
On certificate of payment of the fee at or before the expiration of the third year.....	10	0	0
On certificate of payment of fee payable at or before the expiration of the seventh year.....	20	0	0

By this arrangement a patentee has the opportunity of testing the value of his invention at a moderate expense, and extending his privilege at successive periods, if the result should prove favourable: and a poor man who, under the present law, would be precluded from taking out a patent, might, under the proposed amendment, raise the small amount required in the first instance, and pay the remainder out of the profits of the invention, if successful.

The failure in the attempt to pass the Act in question has disappointed many exhibitors, among whom are several whose inventions consist in improved Chemical processes.

THE MEDICINE STAMP AND LICENCE ACTS.

INFORMATIONS under these Acts are “epidemic,” sometimes in one place, sometimes in another. On each occasion we recur to the subject for the purpose of suggesting a mode of prevention or remedy.

The mode of prevention is obedience to the law. The remedy is the plea of ignorance, and an appeal *ad misericordiam*. The latter alternative being humiliating, and generally attended with some expense, the wise course to be pursued is prevention. In order that the provisions and interpretation of the law may be clearly understood, we have given, on authority, the best explanations we could frame, illustrating the principle by examples, to some of which each case as it arises may be referred.

But every time the epidemic breaks out in a fresh place we have to go over the same ground again; not to mention the numerous individual inquiries answered in the Notices to Correspondents. Questions which were fully discussed and settled in Nottingham, London, and elsewhere several years ago, are revived at Portsmouth, Bristol, Clifton, Oxford, &c., and those who have unconsciously incurred the penalty are surprised to find, when too late, by reference

to the back numbers of this Journal, that the experience of others might have saved them from the annoyance.

We believe that every thing has been said that can be said in elucidation of the subject. Instead, therefore, of repeating the statements, we subjoin a reference to the articles previously written, directing attention especially to the *Instructions to Officers*, vol. viii., p. 153; and *Sailing near the Wind*, vol. ix., p. 298. Mr. Price, in his explanation (vol. iii., p. 50), refers to what was at that time the received interpretation of the Acts, an interpretation in some degree modified by subsequent regulations.

It may be well to state the manner in which proceedings under the Medicine Stamp Acts originate. Officers are sent at intervals to various towns, with instructions to ascertain whether the provisions of the Acts are properly observed. They visit the shops as purchasers of such proprietary medicines as they think likely to be subjects of evasion of the stamp duty. When they meet with a case, they seal up the medicine and forward it with a report to Somerset House. In some instances Chemists, being themselves scrupulous in the observance of the provisions of the law, and finding themselves undersold by their neighbours who omit to affix the stamp, in *self-defence* report the fact. The Commissioners of Stamps send an officer to the town, with instructions to ascertain, by purchasing the medicines in question, whether the statement is correct, and to report accordingly. These visits, however, are frequently made at random, without any previous information. Sometimes the officers exceed their instructions, but the Commissioners make a selection from the cases reported, and rarely, if ever, take proceedings unless they have reason to believe that the omission of the stamp is habitual. We have repeatedly ascertained, on inquiry respecting a threatened prosecution, that the Board was in possession of other cases against the same party. Nevertheless, on a proper representation and appeal, the penalty was mitigated to a small amount. The object of the proceedings is not to raise money by penalties, but to enforce obedience to the law, and considering the absolute power possessed by the Commissioners under the Acts, we must admit that these powers are exercised with moderation, and with a disposition to give the accused the benefit of every doubt which can be raised in his favour. We think it is the duty of every Chemist, so long as the law exists, to make himself fully acquainted with it, and thus to protect himself from annoyance as well as disgrace.

REFERENCE TO PREVIOUS ARTICLES ON THE SUBJECT.

MR. PRICE'S EXPLANATION OF THE ACTS.—The first of these Acts was passed in 1783 (the 23d Geo. III) another Act (the 25th Geo. III) was passed in 1785.

The above Acts have been repealed and followed by others of a similar nature, namely, 42d Geo. III., 43d Geo. III., 44th Geo. III., and 52d Geo. III.

There are *four classes of persons* contemplated by the legislature, and *three sorts of things* as within the scope of the medicine duty laws.

The classes of persons are: First, Those who by apprenticeship to Surgeons, Apothecaries, Chemists and Druggists (and Surgeons of the navy and army), derive the qualification of skill from discipline, for engaging and practising in the sale of drugs and chemical preparations.

Secondly, Persons procuring the legal or statutory qualification of a licence.

Thirdly, Patentees of proprietary preparations in medicine, quacks, or nostrum-makers; and,

Lastly, All unlicensed vendors of drugs and medical compounds.

The three things contemplated are:

First, Drugs, &c. entire. Secondly, Preparations and compounds of those of legitimate character; and, Thirdly, such of the latter as are of spurious or empirical character.

Of the four classes of *persons*, the first class are exempted from all the restraining and disabling provisions, whether by clause or schedule, except that of the impost of *duties* on the third sort of things, which are the subject matter of the statutes if sold by them.

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The second class of *persons* are rendered capable of vending the *first* class of things without payment of other duty than that imposed on the necessary licence, and are authorized to sell the second sort of things on payment *by them beforehand*, of the duties imposed on *their* sale by the law, and also to sell the third sort of things received from the owners or compounders when stamped, as having paid the duty.

The third class of persons consists of all *original vendors*, proprietors, and makers of the third sort of things above enumerated.

Proceedings instituted for selling preparations of sarsaparilla, &c. Vol. Page.
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Remarks on Penalties under the Stamp Acts, with a reference to the Acts now in force, showing their leading features v 532

Prosecutions.—At a Meeting held on the 3d March, 1847, a requisition was agreed upon, calling on the Council to take such steps as might seem advisable, but the prosecutions having been withdrawn, it was considered unnecessary to take any further steps on the subject. vi 504

Remarks on Informations under the Medicine Stamp Act. Numerous writs issued against Chemists for selling quinine wine, essence of sarsaparilla, Gregory's powder, cordial tincture, rhubarb, and a variety of other articles, without stamps. Examples given in which a stamp must be affixed, and in which it is not required..... Vol. Page.
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Further Prosecutions.—Report of a Meeting held at Nottingham, Feb. 22d, 1848. Resolution agreed to, disclaiming any intention of fraud on the revenue, &c..... vii 452

Copy of the INSTRUCTIONS TO OFFICERS relating to Medicine Duty, issued by the Commissioners of Stamps viiii 153

Duty on Licences to sell medicines viiii 154

Inquiries of Correspondents respecting some of the articles enumerated in the Schedule of the Medicine Stamp Act.

Some are practically obsolete: Eau de Cologne and Arquebusade Waters exempted by a Treasury Order. Some lozenges exempted by 55th Geo. III., cap. 184, sec. 54 Vol. Page
viii 212

Fraud and attempt at extortion. Mr. Sewell, of Leeds, threatened with Exchequer process for the alleged offence of selling an article (Cholera Mixture) chargeable with stamp duty, without having a stamp affixed. Letter to Mr. Sewell, signed John Smith, attempting to extort money.... viiii 409

Letter from the Commissioners, stating that no proceedings would be instituted against Mr. Sewell. The Informer dismissed from office viiii 466

The Medicine Stamp Acts in their practical application a source of persecution and injury. The investigation of the subject by the Council, and the applications at Somerset House have led to a more clear and explicit declaration on the part of the Commissioners Vol. Page.
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The Informers contrive a fresh mode of attack. Hitherto the informations referred to the sale of medicines without stamps, when stamps were required. The present line of attack relates to the manner in which the stamp is pasted on ix 118

On the 21st August, 1849, a writ was issued against a Chemist for selling, on the 7th instant, an article of patent medicine (Cough Lozenges) without the stamp duty label being *properly* affixed.

Another illustration of a prevalent system of fraud. A new trap of the Informers.

On the 13th of November, 1849, Messrs. Smeeton and Son, Leeds, received one of the usual intimations from Mr. Timm, to the effect that they had incurred the penalty of £10 for having sold, on the 3d of September, a bottle of cholera mixture without a stamp. The mixture in question was not liable, but had been sent to the Stamp-office enveloped in a printed recommendatory paper, describing Pickering's cholera mixture, quite a different preparation, for the sale of which Messrs. Smeeton and Son were agents..... Vol. Page.
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SAILING NEAR THE WIND.—Examples given. Labels for essence of ginger, essence of ginger and camomile, aromatic quinine wine, cordial tincture of rhubarb, Dr. Gregory's powder, &c. ix 298
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ORIGINAL AND EXTRACTED ARTICLES.

ON THE PRESENCE OF THE HYDRURET OF SALICYLE IN
AQUA CASTOREI.

BY JONATHAN PEREIRA, M.D., F.R.S.,
Physician to the London Hospital.

In the year 1844, Wöhler* remarked that carbolic acid strongly resembled in odour fresh castoreum, and suggested that the volatile oil of castoreum was probably nothing but carbolic acid; and added, that, like the latter substance, it became black by its reaction with chromic acid.

Soon after this observation (I think in October, 1844) I endeavoured to verify it, by subjecting *aqua castorei* fresh prepared from good American castoreum, and in which were floating globules of *oleum castorei*, to the action of a solution of chromic acid; but I failed to produce any blackening effect, even at a boiling temperature. It occurred to me, therefore, that probably carbolic acid was not an invariable constituent of castoreum.

In 1848, Wöhler† announced the existence of both carbolic acid and salicine in Canadian castoreum. By subjecting this to distillation with water, he obtained a clear distillate in which small drops of oil were floating, and which possessed a strong odour of castoreum. With sesquichloride of iron, it gave distinctly, though feebly, the characteristic reaction of carbolic acid; it became violet, which colour again disappeared in a short time, with a whitish cloudiness precisely like carbolic acid. It was not coloured yellow by ammonia, as is the case with hydruret of salicyle (salicylous acid).

In the liquid which was left in the retort, Wöhler detected, after filtration, a benzoate and salicine. On mixing it with muriatic acid, it became turbid, and, in the course of a day, deposited small crystals of benzoic acid. It was also observed that the mother-liquor separated from these crystals contained hydruret of salicyle, for it gave with sesquichloride of iron, first a deep violet blue colour, and only afterwards the white cloudiness produced by benzoic acid. In the muriatic solution, from which the benzoic acid had separated, Wöhler detected salicine by the action of chromate of potash and sulphuric acid, which converted it into hydruret of salicyle.

A few days ago I had occasion to examine the *aqua castorei*, prepared in (I think) 1844, from American castoreum, and was surprised to find that it had acquired the very agreeable odour of the distilled water of the flowers of meadow-sweet (*spiræa ulmaria*). It no longer contained any traces of volatile oil. On testing it with sesquichloride of iron it gave at first a violet colour, and afterwards a whitish cloud (*benzoate of iron*). With ammonia it became feebly yellow. It was obvious, therefore, that it contained hydruret of salicyle.

Now this hydruret of salicyle must either have been originally obtained by distillation from the castoreum, or have been produced in the *aqua castorei* by some other principle. That it was not originally obtained from the castoreum I have strong grounds for believing; because the *aqua castorei*, when first prepared, had not that agreeable odour which it now possesses, but had the usual castoreum smell, and contained abundance of globules of volatile oil of castoreum. For several years past, in my lectures, I have noticed and described it, and have remarked, that unlike another specimen of *aqua castorei*, which I prepared in 1833,‡ it appeared to me to be losing its proper castoreum odour, and to be acquiring a more agreeable one. During the last twelve months, however, the change of odour has been more marked and rapid than it had been previously.

I believe, therefore, that the hydruret of salicyle has been gradually formed in the *aqua castorei*. But from what?

* *Annalen d. Chemie u. Pharmacie*, Bd. xlix., S. 360. 1844; also *Pharmaceutical Journal*, vol. iv., p. 186. 1844.

† *Annalen d. Chemie u. Pharmacie*, Bd. lxxvii., S. 360. 1848; also the *Chemical Gazette*, vol. vii., p. 11. 1849.

‡ This specimen also contains minute traces of the hydruret of salicyle, as shown by the action of the sesquichloride of iron, as well as of ammonia.

As the *aqua castorei*, in which it was formed, was obtained by distillation, it is obvious that the hydruret of salicyle must have been produced from some volatile substance.

Now as the water originally contained globules of *oleum castorei*, which have gradually disappeared, and become replaced by the hydruret of salicyle, this oil would seem to be the real source of the last mentioned substance.

However this may be, it can scarcely be doubted that both the hydruret of salicyle and carbolic acid (which Wöhler declares to be identical with *oleum castorei*) are derived from salicine (the presence of which in castoreum has been before stated.)

As the beaver feeds on the bark of the willow and poplar, we have a ready explanation of the source of the salicine.

Salicine by oxidation readily yields hydruret of salicyle (as by the action on it of a mixture of chromate of potash and sulphuric acid). When it is swallowed it suffers oxidation, and is excreted in the form of hydruret of salicyle. A few days ago Professor Liebig informed me that *Chrysomela Populi*, a coleopterous insect which feeds on the leaves of the willow and poplar, excretes hydruret of salicyle; and if allowed to crawl over paper moistened with a persalt of iron it produces a violet-coloured stain. In the human subject, also, salicine suffers a similar change, and is converted into hydruret of salicyle, which passes out of the system in the urine, in which fluid it may be detected by a persalt of iron, which strikes a violet colour with it. Laveran and Millon* assert that salicylic acid is also produced, but this is doubtful; for Wöhler and Frerichs† found that hydruret of salicyle did not become changed into salicylic acid in its passage through the system. Hitherto, I believe, that carbolic acid has not been detected in the urine after the use of salicine; but its presence is by no means improbable, as it is one of the products of the decomposition of the alkaline salicylates.

But to return to the origin of the hydruret of salicyle in *aqua castorei*. It by no means follows that it should be derived from the carbolic acid, but more probably from some other volatile product of the oxidation of salicine.

As carbolic acid is a constituent of castoreum, and as it is a powerful agent on the animal economy, it follows that it must be one of the active principles of castoreum. Wöhler and Frerichs found that rabbits, guinea-pigs, and dogs, to which a few drops of carbolic acid diluted with water were administered, constantly died in convulsions in the course of one quarter of an hour; but no important anatomical lesion was discovered in the bodies after death.

As castoreum contains but very minute quantities of carbolic acid, it is obvious that should its medicinal activity be found to depend on the latter, a cheap and more effective substitute for castoreum would be found in carbolic acid obtained from coal tar.

And here I may observe that carbolic acid and creosote are closely related, if indeed they be not identical, as Laurent and some other Chemists suspect.

As the odour of hyraceum closely resembles that of castoreum, the presence of carbolic acid may be suspected, but no evidence of its presence can be gained by the action of the sesquichloride of iron on either a watery infusion of hyraceum, or on the distilled water of this substance.

ON CASSIA FISTULA.

BY DR. X. LANDERER,

Hon. Member of the Pharmaceutical Society of Great Britain, Professor in the University of Athens, Pharmacien to the King of Greece, &c.

PHARMACOLOGISTS distinguish the following varieties of the drug called Cassia Fistula, namely:

* *Comptes Rendus*, t. xix., p. 347.

† *Ann. d. Chem. u. Pharm.*, Bd. lxx., S. 335. 1848. Also *Chemical Gazette*, vol. vi., p. 229. 1848.

1. *Cassia Levantica*.
2. *Cassia Egyptiaca*.
3. *Cassia occidentalis*.
4. *Cassia fistula Brasiliensis seu Marylandica*. [?]

Respecting the second of these, Egyptian Cassia Fistula, I have received some particulars not wholly without interest, which I will venture briefly to detail.

Among laxative and resolvent medicines none is more frequently employed in the East than Cassia Fistula administered in the form of decoction, or as an electuary mixed with a sweet or acidulous beverage, as Bosá or Scherbet.

The use of Cassia has of late much diminished and the culture of the trees in Egypt is becoming somewhat neglected. At the present day the *Cassia fistula*, Lin. grows in the neighbourhood of Aphti, a village near the towns of Damation and Feraskuri, which are about two days journey from Alexandria. The trees, which are here sufficiently numerous to form a little forest, are from forty to fifty feet in height, and frequently exceed two feet in circumference; their age is estimated by the villagers at from two to three centuries. In January and February the trees flower; the large yellow very odorous blossoms are employed by the inhabitants of the country as a perfume for the clothes. The collection of the fruit commences in June and lasts till August. Loaded with thousands of long pendulous fruit reaching to the earth, the Cassia trees at this period present a most interesting appearance, reminding one by their pendant branches of the weeping-willow. Under their shade the Arab protects himself from the burning heat of the sun, and there also seeks shelter at night.

The quantity of Cassia Fistula carried to the bazaars of Alexandria and Cairo amounts to 500 quintals [50,000 pounds weight per annum], the half of which is consumed in Egypt, the remainder being exported to Constantinople, Marseilles, Trieste and Odessa.

The Egyptians imagine the immature fruit superior to that collected when perfectly ripe,* and by the dealers the smaller pods are preferred.

[There is some ambiguity in the author's enumeration of the varieties of Cassia pods, which are the produce of two distinct species, namely:—

1. *Cassia fistula*, Lin., *Cathartocarpus fistula*, Persoon. The pods of this species may be distinguished according to their place of growth, as *Cassia fistula orientalis* and *Cassia fistula occidentalis*.—See Hill's *History of the Materia Medica*, London, 1751. By some writers, as Pomet, two varieties of *Cassia fistula orientalis* are noticed, namely, *Cassia fistula* of the Levant, and *Cassia fistula* of Egypt.

2. *Cassia Brasiliana*, Lam. This produces the horse cassia of Jamaica. It is not used in Europe.

The dried leaves of *Cassia Marylandica*, Linn., a plant of the United States, are there employed as senna, but we are not aware that the pods of this plant are used in medicine.—Ed.]

ON THE BLACK BALSAM OF PERU.

BY DR. THEODOR MARTIUS.
Professor in the University of Erlangen.
(In a Letter to Dr. Pereira).

MY VERY ESTEEMED FRIEND.—I have read with great pleasure your interesting article on Black Peruvian Balsam†, and although no one is better circumstanced than yourself, both by your extensive connexions, and by your residence in the emporium of the world, to enlarge our knowledge on subjects like these, yet as there are some points in your treatise which it appears to me well deserve further investigation, and as both of us are animated with the

* See also Woodville's *Medical Botany*, p. 450.—Ed.

† See the *Pharm. Journ.* vol. x., pp. 230 and 280.—Ed. *Pharm. Journ.*

desire of elucidating the truth, I do not hesitate to draw your attention to the following circumstances:

The method of obtaining black Peruvian balsam has always been a subject of controversy. When my late friend *Stoltze*, published in the year 1824, his *Treatise on the Black Peruvian Balsam*, I could not convince him that the balsam is obtained by a sort of *distillatio per descensum*, and not by decoction or spontaneous exudation as he stated. I find my opinion corroborated by what you state in your article, but that the balsam should, by boiling the rags in water, rise to the surface, and thus be removed, is impossible, for it has a specific gravity of from 1.150 to 1.160, and cannot, therefore, float on water by boiling. If a solution of common salt, that is to say, a liquid of a greater spec. grav. were employed, the balsam would then certainly float, but at the same time its agreeable odour would probably disappear, in consequence of the high temperature required for boiling the saline solution. As moreover, the cinnamic acid contained in the black balsam is soluble in water, the greater portion of this acid would be given out to the liquid employed for the exhaustion of the rags. I must confess, that now and then, single drops of water, and sometimes even entire layers of water, as thick as the back of a knife, were supernatant in the tin boxes, in which formerly the black Peruvian balsam was exported; but this trifling portion of water I have always considered to be the product of *distillatio per descensum*, and have never found in it by evaporation, anything but cinnamic acid (formerly regarded as benzoic acid). Moreover, whence arises in many of the tin boxes the sediment of several fingers' height found in them after remaining at rest? Furthermore, what is the reason that the *tinctura balsami Peruviani* is sometimes of a lighter, and sometimes of a darker wine-yellow colour, according as it is prepared from a lighter or darker coloured balsam? I think this originates from the higher or lower degree of heat employed in the *distillatio per descensum*. I must also observe, that several years ago, a sort of black Peruvian balsam was in the market, which, on running down the glass, appeared of a reddish-brown colour, was more fluid, and yielded, even after continued standing, a proportionately very insignificant sediment. All this tends to show, that besides the various kinds of *Myrospermum* used for yielding the balsam, the higher or lower degree of heat employed in its preparation, must contribute to vary the quality of the balsam obtained.

Stoltze says in his article (*Berlinisches Jahrbuch*, 25 Jahrgang, Abtheil. 2, p. 25), that he has never observed in his operations the products of a descending distillation, but there is a great difference between such a process and a gentle *distillatio per descensum*. Moreover, it must not be forgotten, that the plants which yield the black Peruvian balsam, grow in a country which is in the highest degree favourable to the exudation of resinous juices from vegetables. Besides, the formation of cinnamic acid takes place, as it appears, only by the absorption of oxygen or by an increased temperature. How do you account for the presence of this acid in the balsam, and that in such large proportion?

As it is my great desire to have all these matters explained, I applied to Bordeaux, which town carries on a considerable trade in black Peruvian balsam; and the following is the answer of my friend, dated July the 27th:—

"*Balsamum Peruvianum nigrum* is generally exported from Sonsonate and Ajacutla (Central America) in jars, and is mostly transferred in Europe into tin-boxes, when it is at the same time deprived of water, macilage, and salt, which I generally effect in a bathing-tub. For some time past the English have begun to take possession of this article, and import it from the eastern part of Central America, by way of Belise or Greytown. One of our captains, who formerly imported 200 jars of balsam, saw them being filled, and was not a little astonished on finding here that water had separated during the voyage. In a fresh state the balsam is more greenish and more fluid than after having been kept for some time, when it flows with a golden brown colour, and runs down the glass with a reddish colour. White Peruvian balsam I have never seen; but I saw the fruit-capsules of the Peruvian balsam-tree, which were very resinous, and might, perhaps, yield a white or pale elemi-yellow coloured balsam." Thus far my friend.

From his communication it appears,

1. That black Peruvian balsam sold retail, has already undergone a purification.
2. That the Peruvian balsam, as imported from America, contains water, mucilage, and salt; and
3. That the balsam in a fresh state is not only more fluid, but likewise possesses a greenish colour.

But at the same time, all that I have now stated about this subject tends to show that we are not yet perfectly acquainted with the method of obtaining the balsamum Peruvianum nigrum. I should be very glad to find that my observations have been the cause of further investigation on this subject.

I take at the same time the liberty to direct your attention to the fact, that in the work of Hayne (volume xv. ?) there are two figures of Myroxylon, of which one differs from the plant which you had the kindness to show me.

My dear Friend,

Your most obedient humble Servant,

DR. THEODOR MARTIUS.

London, 3rd October, 1851, 27, Trinity Square, Tower Hill.

(DR. PEREIRA'S REPLY).

Finsbury Square, October 25, 1851.

MY DEAR DR. MARTIUS. — Your remarks respecting the relative specific gravity of the balsam of Peru and water, and the consequent impossibility that the balsam should float on the water, are quite correct; and I have no doubt that the statement should be reversed, and that the water floats on, and therefore, must be skimmed off the balsam. Indeed, within the last few days, Mr. Skinner has shown me a paper written in Spanish, on the dictation of a native Indian, in which it is so stated.

That heat is employed in the preparation of the balsam is stated in Mr. Klée's letter appended to my former paper. But this gentleman merely says that the natives "burn the outside [of the bark of the tree] slightly." This scarcely amounts to a "*distillatio per descensum*." Mr. Skinner, however, tells me that when he was in Guatemala, he was informed that the balsam was obtained thus: A fire was made around, but at some little distance from the balsam tree. The bark was then cut, and a stick was slipped in between the bark of the tree and the wood, so as to partially separate these two parts of the stem from each other. By working the stick about, somewhat in the manner of a pump-handle, the balsam, aided by the heat, exuded, and was absorbed by rags.

The pale wine-yellow coloured balsam of Peru, as well as the greenish balsam, alluded to in your letter, I am unacquainted with.

The turbid aqueous liquid which you and I, in company with Mr. Skinner, obtained at the London Docks, and which we were told had been drawn from a jar containing balsam of Peru, has, I find, an agreeable balsamic odour, an acrid balsamic taste, and a specific gravity of 1.020 at 64° Fahr. This greater density than water can be owing in a very minute degree only, if at all, to the presence of common salt; for, although on the addition of a solution of nitrate of silver, the liquid becomes very turbid owing to the formation of a white precipitate, yet as nitric acid dissolves this precipitate and renders the solution clearer than it was before the addition of the nitrate, it is obvious that a very minute portion only of any chloride can be present. The liquid reddens blue litmus paper, owing, doubtless, to the presence of cinnamic acid.

The only purification to which balsam of Peru is subjected in England is one of a mechanical kind, that is, by standing the balsam is allowed to separate from the water and any other impurities, and is then drawn off.

Believe me to be, my dear Dr. Martius,

Faithfully yours,

JONATHAN PEREIRA.

Dr. Theodor Martius, Professor in the University of Erlangen.

P.S. I am indebted to Mr. Skinner for the following note respecting the extraction of balsam of Peru.

Mr. Saravia, of Sonsonate, having been requested to question the Indians respecting the production of balsam, replied, under date November 25, 1849:—

"The manner used to extract the balsam from the trees, is to make several incisions in the tree, over which they place pieces of old cloth or rags, which absorb the juice, which when they observe to be well soaked, they put in water to boil, until the rags have discharged the greatest part of the balsam which they had imbibed. They then allow it to settle sufficiently until the water rises, leaving the balsam at the bottom; they pour off with care the water, afterwards filling '*tecomates*' (gourds) with the balsam, although it is not now very pure. The rags are then put into '*redes*' (little bags of cords), which when strongly twisted wring any remaining balsam out of them into the '*tecomates*.' When we purchase it, it is necessary to clean it again, because it still contains water and other impurities, which some Indians will mix with it to gain greater weight, and which some practise. I have the trunk of the tree, branches, and seeds ready to send off for you, but it is not now flowering season, and you must wait another occasion.

"The drawing you ask for is very difficult, because the Indians would not allow it. They are very subtle and wanting confidence, and would believe us engaged in something which might be prejudicial to them; besides, I know no one capable who could go to the villages of the coast and do it.

"The white balsam is not known here, and the only one known here is one which the Indians make, by breaking the seeds, and collecting one or two drops which they find within, and to which they give the name of *balsamo virgen*; its colour is that of *French olive oil*, all the virtue of this you have in the balsamito."

CULTIVATION AND MANUFACTURE OF PATNA OPIUM.

THE India section of the Great Exhibition contained a most complete collection of specimens, drawings, and implements, illustrative of the cultivation and manufacture of Patna opium. Unfortunately, however, no description of the processes accompanied the illustrations; and, therefore, to explain the figures which we have had engraved from some of the drawings, we have been obliged to obtain our information from various sources.

The drawings which were sent over were fifteen in number. Several of them, however, rather illustrate the general processes of agriculture followed in India, than anything peculiar to the cultivation of the poppy. Of these, therefore, we have not thought it necessary to have copies made.

Our first cut represents a native engaged in thinning and weeding the poppy plants. "The poppy," says Mr. W. B. Johnson, "requires a good, rich, dark soil, well prepared with manure, and divided off into small oblong plots, of about six by four feet, for the convenience of weeding and patching. The sowings commence early in November. The day the seed is sown, the land is well watered; on the next day, the ryot breaks all the lumps with his *khoorpi*. The plant soon shoots up, and when about six inches high, it is thinned and weeded; it is kept well watered, until the capsules are nearly ripe, and the petals falling off; it then depends upon the state of the weather; if mild, the irrigation is continued; if strong winds, it is discontinued, for fear of being blown off."

"The poppy," says Mr. Impey, "takes three months and a half to arrive at perfection, at least to the transitory and half-ripe state, between the fall of the petal and the dehiscing of the pericarp, which is the period most favourable to the extraction of the juice, and it grows to the height of four feet and upwards, when well attended to. Its erect stem is divided into from four to fourteen branches, which strike off at various heights, the lowest usually two and a half feet from the ground. The capsule in a full grown state, measures frequently three and a half inches long by two in diameter."

FIG. 1.

*A Native engaged in Weeding the Poppy Plants.*

2. Our second cut represents a native woman pulling off the poppy petals, for the purpose of making leaves for the envelope of the opium for the China market. Each cake or ball of opium consumes five chittacks* of these leaves.

FIG. 2.

*A Native Woman gathering the Poppy Petals.*

Speaking of the cultivation of the poppy in Malwa, Mr. Impey says :—

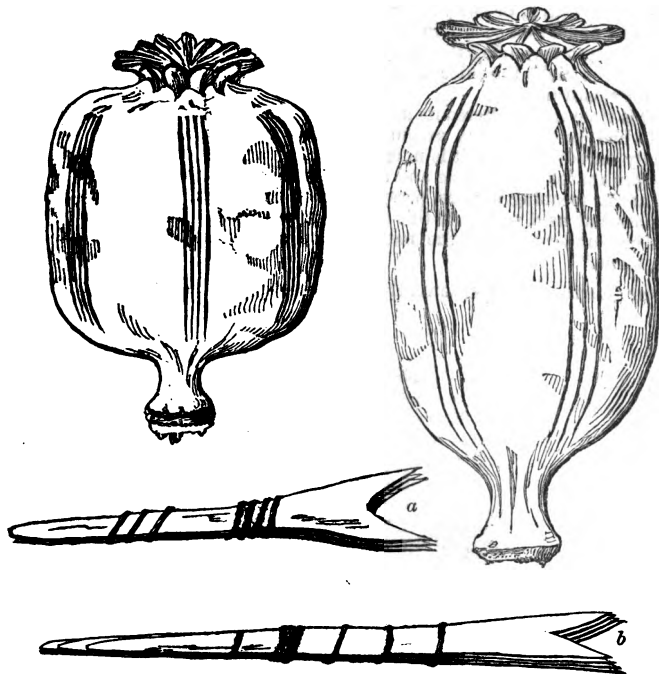
“The petals and leaves, which are in other districts kept to form the covering for the cakes, are permitted to fall off, and not applied to any purpose, nor even sold by the ryot; but poor people gather them, and when a sufficient quantity is collected and pounded, dispose of them to the Buniahs and opium-dealers (at rupees 6 per maund) who require them for packing and wrapping the cakes.”

* A chittack, or chitak, is equal to 1 oz. 17 dwts. 12 grs. English troy weight.

3. The next operation is that of tapping or bleeding the poppy capsules. This is effected by making a series of parallel wounds in the exterior surface of the capsule with the instrument called a *nushtur* (fig. 3, *a* and *b*). This consists of several (three, four, or five) heartshaped lancets or blades, tied together with some cotton thread.

Our third cut represents two poppy heads of the natural size, with two *nushturs* or incising instruments. It will be perceived that the *nushtur* marked *a*, consists of three lancets, while the *nushtur* marked *b*, is composed of four

FIG. 3.



Poppy Heads and Nushturs (natural size).

The Poppy Heads have been scarified or wounded in parallel lines.

lancets, in both cases bound together by cotton. Mr. Johnson says, that the wounds ought to be made diagonally, to prevent the juice falling off in the night, when the dews are heavy; and Mr. Impey states that in Bengal they are made so. But in the two poppy heads represented in our cut, which was made from specimens sent over for the Exhibition, the incisions have been made perpendicularly.

Speaking of the *nushtur*, Mr. Impey states, that so much only of the points is allowed to protrude

“as is actually necessary, so that no discretion or latitude in manipulation is left to the labourer; the length of the point which protrudes externally is one-twelfth of an inch, and the distance between each blade one-eighth. The area of the beegah is at this time imaginarily divided into three or four compartments, and the labour apportioned accordingly, the different processes of bleeding or gathering the juice going on separately in each, when the previous one has been finished; three men are employed, and in this way each plot is bled every three or four days; twelve days are required to complete it, so that each capsule becomes wounded three, and occasionally four and six times, if the heads are large, but this is not of frequent occurrence.

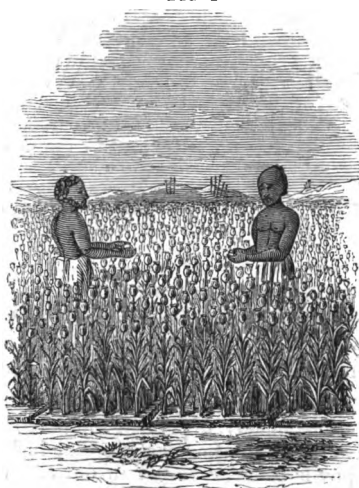
"The mode of wounding the capsule is as follows—being depressed and held almost horizontally to admit of greater facility and steadiness in cutting, the incisions are made longitudinally and from below upwards, about 3 P. M., or in the hottest part of the day, and after the collections from former incisions have terminated. A small quantity of white milky juice exudes almost immediately upon the incision being made, of the consistence of cream, on the surface of which after a short time a slight pellicle forms by the power of the solar rays, which is the result designed in doing it at this hour. By the continued force of the same influence, a greater degree of evaporation and inspissation takes place (but not sufficiently to close the orifices of the wounds), which prevents the juice falling off the capsule, although, when the night dews are heavy, or the juice very plentiful, this cannot altogether be avoided. The greatest exudation occurs in the night time, from the dew washing and clearing the incisions and favouring the escape of the juice.

"During the night the juice continues to ooze out gradually, and in the morning it is fit for removal.

"By this time it has altered its appearance. Instead of the white milky character which it had before, it has assumed a thick gummy consistence, and exhales a powerfully narcotic smell; it is much darker, of a light drab colour, and streaked with deeper shades of the same and red and black striæ, the latter known as *paséwá*, a term, as the meaning implies, perspiration or exudation, literally applicable to the whole mass, but used to denote this especial appearance. The nature of the juice is perhaps best understood by the native name applied to it in Central India, viz., *Anglice*, slime."

4. Our fourth cut represents the natives engaged in scraping off the exuded juice.

FIG. 4.



Natives engaged in Scraping off the Exuded Juice.

"Scraping, the next process," says Mr. Impey, "is commenced on the following morning at sunrise, and executed with rude blunt iron scrapers, resembling a cleaver in miniature. A small piece of cotton soaked in linseed oil is stuck on the upper part of the blade, and both the thumb and edge of the scraper are occasionally smeared with it, to guard against the glutinous effects of the juice, which would otherwise adhere strongly to the fingers. Towards the point of the scraper, the most pure juice is gathered, for there the first scrape is made; the second is done more with the beel of the instrument near the handle, and the juice is much lighter in colour. It is in this act the first sophistication occurs, the scraper being carried heavily over the capsules, taking with it a considerable part of the beard or pubescence.

"The manner in which scraping is performed, is by grasping the capsule between

the thumb and fore finger of the left hand, inclining it gently as in bleeding; the thumb of the right hand being then placed on the top of it, the scraper is drawn briskly upwards, almost similar to the making of a pen. This is repeated twice; every head is of course submitted to the process, and each is considered to yield in toto a masha's weight of juice, which is equivalent to about 15 grains troy. In full-grown fruitful fields, each man will collect upwards of half a pound of chick per day, at least, by 10 A. M., by which time this part of the work is over."

Dr. Butter, in his account of the preparation of opium for the China market, observes, that

"The goodness of the soil, and the management of the irrigation, are circumstances which powerfully affect the strength of the juice at the time of its collection: but a third agent, still less amenable than these to control, now comes into play, the precipitation of dew on the surface of the capsule. When a current of wind, or a cloudy sky, prevents the formation of dew, it is found that the scarifications made in the capsule about the middle of the preceding day are sealed up by the slight oozing of juice, which had immediately followed the incisions; and the quantity of opium obtained is small. When, again, the dew is abundant, it washes open the wounds in the capsule, and thus facilitates the flow of the milk, which in heavy dews is apt to drop off the capsule entirely and be wasted. But when the dew is in moderate quantity, it allows the milk to thicken by evaporation, and to collect in irregular tiers (averaging one grain of solid opium from each quadruple incision), which, on examination, will be found to have a greater consistency, and a 'rose-red' (Werner) colour towards the external surface, while the interior is semi-fluid, and of a 'reddish-white' colour. This inequality of consistence constitutes the *grain of raw opium*, of which I shall have to speak hereafter.

"In the collection of these drops of half-dried juice, it is very apt to get mixed with the dew, which, in the earlier hours of collection, continue to besprinkle the capsules, and which here does a double mischief—first, by retarding the inspissation of the general mass of the juice; and, secondly, by separating its two most remarkable constituent parts—that which is soluble, and that which is insoluble in water. So little aware, or so reckless, even under the most favourable construction of their conduct, are the *koeris* of the injury thus caused by the dew, that many of them are in the habit of occasionally washing their scrapers with water, and of adding the washings to the collection of the morning. In Malwa oil is used for this purpose, to the irremediable injury of the flavour of the opium. On examining the juice thus mixed with water, it will be found that it has separated, as above-mentioned, into two portions, a fluid and a more consistent; the latter containing the most of the resin, gluten, caoutchouc, and other less soluble constituents of opium, with part of the super-meconiate of morphia; and the former containing the gum, some resin, and much of the super-meconiate of morphia, and much of the colouring principle, which, though pale at first, is rapidly affected by light, and acquires a very deep 'reddish or blackish brown' colour. Many *koeris* are in the habit of draining off this fluid portion into a separate vessel, and of bringing it under the name of *paséwá*, for sale, at half the price of opium, to the Benares agency, where it is used as *léwá* (paste for the petal envelopes of the cakes.) Others, after allowing the soluble principles to become thus changed into an acescent, blackened, sluggish fluid, mix it up with the more consistent part of their opium, and bring the whole for sale in this mixed state; the consequence of which is that they are subjected to a penalty, called *battá upon paséwá*, and regulated by the estimate of the opium examiner, of the quantity of *paséwá* contained. This penalty is the only efficient check upon this most pernicious practice of the *koeris*: for on the generality of the *gomáshtas* it is difficult to impress the necessity of their looking after the *koeris* during the collecting season."

Mr. Impey, alluding to the practice in Malwa, says :

When the capsules crack and turn brown they are pulled off the stalks, and the seed shaken out; the heads are then thrown away. In poor districts, where the people cannot afford the indulgence and luxury of opium for smoking and chewing, the poppy heads are made into a decoction, and the liquid drank in its stead. This liquid, from the Persian name of the capsule, is termed 'Post.' But another and more useful application of the capsules is also exercised—they are ground into fine powder, and, like the leaves, sold under the name of *bocsa* to the retailers,

and sprinkled over the *buttees* of opium, both to prevent their adhesion and form a covering for them.

"The seeds are a very useful part of the plant, and very plentiful. From two to five maunds are procurable from a beegah, which obtains ready sale at 12 to 16 seers for a rupee; a very small quantity being required for seed, the rest is converted into oil, which, according to the native mode of expression, gives one-third in weight. According to Dr. O'Shaughnessy, it yields 56 per 100; it is of a pale yellow colour, clear, burns well, but is not adapted for lamps on account of the smoke and smell which it gives out. The oil is very cheap, selling at 8 seers per rupee, and the refuse is an extremely wholesome and nutritious food for cows, termed here *Khari*, it sells at the low rate of 8 annas per maund. Lastly, the stalks, which might be made use of for fire-wood, are left in the ground untouched and unheeded."

5. The juice which is scraped off the poppy heads, is collected in shallow earthen pans, and is removed in these from the fields.

FIG. 5.



A Native carrying the Opium from the Fields in which it has been collected.

Our fifth cut represents a native engaged in this operation.

6. Our sixth cut represents two natives engaged in manipulating the opium, with a view to its introduction into the earthen-vessels or bottles.

FIG 6.



Natives manipulating the Opium.

Several of these earthen-vessels (called *gumlahs*) are figured. The lower half of each is surrounded with wicker-work to protect the vessels. The native dealers judge of the consistence of the opium by the feel. Dr. O'Shaughnessy says that the opium brought to the factories contains from 64 to 68 per cent. of solid matter, but that by evaporation, it reaches the consistence of 70, the standard of the factory for the Chinese investment.

7. We have already alluded to the *léwá* or paste for uniting the poppy petals so as to form the shells or envelopes of the spherical cakes or balls of opium. Our seventh cut represents a native engaged in preparing the balls.

FIG. 7.



A Native engaged in the Manufacture of Ball Opium.

Dr. Butter observes, that,

“in the Benares shells, the *léwá* remains visibly interstratified with the petals, dark-coloured and tenacious; while in the *Behár*, it is in a great measure absorbed by the petals, which are apparently in intimate contact with each other, and is not to be distinguished from them.”

He further observes, that

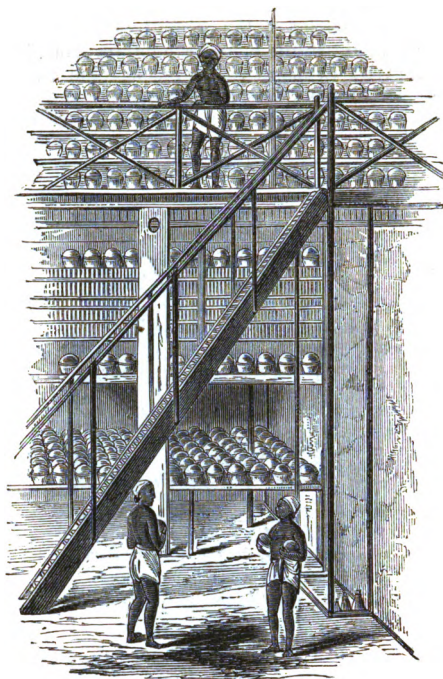
“any strong cheap mucilage or farinaceous paste, or perhaps some indigenous imitation of bird-lime, would answer for the inner portion of the shell; and an exterior coating of a resinous, waxy, or oily nature, impervious to water, would defend this from the moisture of the air.”

In reference to the shape of the cakes, he says:—

“The shape ought to be as nearly spherical as possible—that being the geometrical form which, under the smallest surface, contains the greatest quantity of matter, and which, consequently, affords the least scope for the extrication of air, and ultimate injury to the shape of the cake when that air escapes. Greater attention to boring the earthen cups, in which the cakes are dried, *perfectly* hemispherical, instead of parabolical as they now are, would contribute to the desired sphericity’.

8. Our last cut represents a section of an opium store, with the balls of opium contained in their earthen cups.

FIG. 8.

*Opium Store.*

We shall conclude our notice of the manufacture of Patna opium, with the following extract from Mr. Johnson's paper :—

"A biggah of good land requires about 3 seers of seed, if not required to be resown, and yields to the ryot 15 seers of opium. At the present price paid for it by the H. C. Co.'s Rs. 3/10, this gives Co.'s Rs. 4/56. Five maunds of seed at the average bazar rate of 25 seers per rupee, bring eight rupees. The leaves are also bought for filling up the boxes (or rather chests), in packing, at 4 annas per maund, and are called trash or *pate*. The petals are formed into masses and paid for at first quality 10 Rs. per maund; second ditto at 7 rupees; third ditto at 5 rupees; produce say 15 rupees; so that the total value of a good biggah of opium land is Co.'s Rs. 80, with the stalks for fire-wood, exclusive of other crops in the year.

The quantity of opium paid for from each district last year is as follows, viz.:—

	Factory Maunds.
Tirhoot	3507 13 15½
Sarun	5197 37 15½
Champarun	3931 26 11½
Shahabad	3881 24 1½
Behar	2610 13 10½
Patna	2400 36 60
Bhaugle pore	218 23 12½
Monghyr	812 12 5½
Purneah	360 20 5½

Total, at 80 tola weight and 70 lowest consistence... 22,922 9 3½"

TINCTURA HYRACEI.

BY DR. THEODOR MARTIUS.

IN Dr. Ludwig Fikentscher's Inaugural Dissertation on Hyraceum, a formula is given by Professor Martius for the preparation of a tincture of hyraceum. It is stated to be the result of numerous experiments made to determine the solubility of hyraceum and the extractibility of its resinous constituent. He ultimately decided that an aqueous-spirituos tincture would be the most suitable and agreeable form; and the following is the formula which he has published:—

R Hyracei Contusi, ℥iij.
 digere calore 24—30° R. [=86°—99° 5 F.] cum
 Aq. Destillat. ℥xviij.
 per dies octo, sæpius conquassando. Filtra et solutioni adde
 Aq. Destillat. q. s. ut pondus sit ℥xxj. Adde
 Alcohol Vini (32° Beck.) [=sp. gr. 0.843] ℥iij.
 M. filtra. S. Tinctura Hyracei Martii

The dose at first is twenty drops three times, which may be increased to a tea-spoonful.

HYRACEUM.

IN the last volume of the *Pharmaceutical Journal* (pp. 119, 558, and 559) we published several papers on this newly introduced drug, and we propose, on the present occasion, to lay before our readers some additional information respecting this substance, specimens of which were shown in the Cape of Good Hope section of the Great Exhibition.

Reichel* has made an analysis of hyraceum, and found in 100 parts the following ingredients:—

Thick yellow volatile oil	0.666	Brought forward.....	38.919
Yellow fat	0.250	Lime	2.816
Castorin	0.166	Magnesia.....	2.600
Ammonia	1.666	Potash.....	22.500
Urea	2.173	Soda.....	15.433
Albumen	0.083	Sulphuric acid	0.500
Uric acid.....	0.833	Hydrochloric acid	1.316
Benzoic acid	1.500	Silica (or sand)	1.250
Hippuric acid	3.166	Moisture	5.333
Resin (benzoic kind).....	1.750	Hairs and fibres (intermixed) ...	0.355
Extractive (bitter, brown)	22.500	Carbonic acid and loss	8.978
Melanic acid	4.166		
			100.000
Carried forward.....	38.919		

It will be observed here, that Reichel found the constituents of urine in hyraceum.

More recently, Dr. Fikentscher† has examined hyraceum, and found in 100 parts:

Matter soluble in ether	11.5
Matter soluble in spirit of wine	38.0
Matter insoluble in both	19.1
Inorganic salts	31.4
	100.0

He could not detect urea, uric acid, hippuric acid, benzoic acid, or carbolic acid. He concludes, therefore, that it is in the highest degree improbable that

* *Pharm. Central Blatt* for 1849, page 670.

† *Das Hyraceum in historischer, chemischer, pharmaceutischer und therapeutischer Beziehung*, Inaugural-Abhandlung der Medicinischen Facultät in Erlangen vorgelegt von Dr. Ludwig Fikentscher. Erlangen, 1851.

hyraceum can be solidified urine, and that combining his chemical results with the microscopic examination of hyraceum, no doubt can exist that this substance is intermixed with the excrement of an herbivorous animal.

We have before stated (*Pharmaceutical Journal*, vol. x., p. 559) that the excrement of the *Hyrax Capensis* has not the odour, or, we may add, the appearance of hyraceum.

ESSENCE OF JARGONELLE PEAR.

THE liquid sold under this name, and which has been for some time in use by confectioners, is the *acetate of the oxide of amyle*.

It is prepared with great facility by submitting to distillation a mixture of one part of amylic alcohol (better known by the name of oil of grain), two parts of acetate of potash, and one part of oil of vitriol. The distilled liquid is to be washed with alkaline water, dehydrated by chloride of calcium, and afterwards rectified by distillation from protoxide of lead.

Its properties are thus stated by Dumas:—In the state of purity it is a colourless, very limpid, volatile liquor, which boils at 257° F. It possesses an æthereal aromatic odour, somewhat resembling acetic ether; its sp. gr. is less than that of water. It is insoluble in water, but soluble in alcohol, ether, oil of grain, &c. Concentrated sulphuric acid does not colour it in the cold; but by heating the mixture it becomes reddish-yellow, and when the temperature is elevated, destructive reaction takes place, the mixture blackens and evolves sulphurous acid. Placed in contact with a watery solution of potash it is very slowly altered; but an alcoholic solution of this base rapidly decomposes, an alkaline acetate is formed, and the oil of grain regenerated.

Its ultimate composition is

14 equivalents of carbon	84
14 " " hydrogen	14
4 " " oxygen	32

130

But its proximate composition is amyle (an hypothetical radical), oxygen, and acetic acid.

1 equivalent amyle ($C_{10}H_{22}$)	71
1 " oxygen	8
1 " acetic acid ($C_4H_8O_2$)	51

130

Its formula is thus stated by Brande, $AylO, AcO_2$; by Fownes $AylO, C_4H_8O_2$.

Amylic alcohol, or *oil of grain*, called by the Germans *fuselol*, is the hydrated oxide of amyle, $AylO, HO$. It is largely produced in the distillation of spirit from corn. It is official in the Dublin Pharmacopœia, where it is termed "*Alcohol amylicum—Fusel oil*," and is employed to yield valerianic acid in the process for making "*Sodæ Valerianas*."

From information which we have received, we have reason to believe that the use, by very young children, of articles of confectionary, flavoured with essence of pear, is not without danger. A child on two occasions became partially comatose, with livid lips and feeble pulse, after eating some confectionary which it was calculated contained about one drop of the essence.

ESSENCE OF PINE-APPLE.

THE substance used under this name for communicating a pine-apple flavour to confectionary, rum, &c., is essentially butyric ether, but contaminated with capric and caproic ethers. The mode of obtaining it and its composition has already been stated in this Journal. (See *Pharmaceutical Journal*, vol. iv., p. 95. 1844.)

ARTIFICIAL ESSENCE OF BUGS.

In a former number we adverted to the circumstance of a Chemist being requested by a homœopathic doctor to prepare for him some tincture of bugs, which he declined to do. We know not to what extent this remedy is in demand among the homœopaths, but have no doubt that a mode of preparing the essence artificially will be found more agreeable and convenient than the ordinary process, which involves the necessity of first catching the animals. The compound to which the term artificial essence of bugs has been applied, is called, in scientific language, *oxalate of oxide of amyle* ($\text{Ayl O, C}_2\text{O}_4$.) It is obtained by heating oil of grain with excess of oxalic acid. An oil-like liquid separates, which is amylo-oxalic acid, and which distilled at 500° , yields the required product. We have no doubt that when reduced by proper dilution to the state of a homœopathic tincture, it will be found quite as efficacious as the tincture of the animal, of which it possesses the characteristic odour.

MONOPOLY OF YELLOW OR CALISAYA BARK.

[THROUGH the kindness of some friends we have been favoured with a copy of the *Report of the Secretary of the Treasury of Bolivia to the National Bank of Bark*, and also with a copy of the *Decree of the Government of Bolivia*, prohibiting bark cutting in the Bolivian forests for three years. The results of these monopolies, by raising the price of Calisaya bark, has been to force the manufacturers of quinine to resort to the inferior but cheaper quinine-yielding barks of Carabeya, Bolivia, and New Grenada.—ED. PHARM. JOURN.]

REPORT OF THE SECRETARY OF THE TREASURY OF BOLIVIA
TO THE NATIONAL CONGRESS, REGARDING THE NATIONAL BANK OF BARK.

It is highly satisfactory to me to announce to Congress the establishment of the National Bank of Bark, which has been accomplished in the city of La Paz, by means of the authentic contract entered into between the Government and Messrs. Aramayo Brothers, under the conditions and bases of their proposal and those contained in the supreme resolutions of the 17th and 26th January, 1850. The constant desire of the nation expressed in the solemn legislative acts since the year 1839, had been for an establishment of this nature, composed of native shareholders, and with sufficient funds to give regularity to the bark trade; purchasing it in the interior of the country at a fixed price, advantageous to the cutters of the country, and selling it abroad at the value due to an article of exclusive production in the woods of Bolivia, and of the first necessity and great demand in the trade of the world.

The free export of bark would be fatal to our commerce, for undoubtedly, a supply greater than the demand would force down the price, subjecting its value to strange vicissitudes and irregularities. A monopoly of four persons, like the extinct one of Pinto and Co., even if it could force up the price to a high point abroad, would neither satisfy the exigencies nor consult the interests of the national industry. Four lucky contractors would thus have used for their exclusive benefit a spring of wealth that should flow abundantly for all the sons of our soil.

The present bank, avoiding both extremes, is that mid-term of justice and general and individual commerce, that common centre that conciliates and cements the interests of the national industry, public wealth, and the governmental treasury.

Consequently the bank maintains the monopoly, and with it the high value and price of bark. Its shareholders, at present eighty in number, are all Bolivians, which is significant of the fact, that in the bank there has been a concentration of capital, the benefits of which will be distributed among numer-

ous Bolivian families. The bank purchases the bark according to its different qualities at the prices of sixty, thirty-five, and thirty dollars per quintal. This produces an immense good to the Bolivian cutters and labourers, who formerly never saw the price of the best bark exceed eighteen or twenty-two dollars a quintal. Finally, the national Treasury receives for duties twenty-five to fourteen dollars a quintal; which, on seven thousand quintals that the bank has the privilege of exporting annually, amount to \$142,000, which are paid into the Custom-house of La Paz in advance in monthly sums of \$11,833 2 reals. Such are the advantages that have been realized, and so great the interest promoted at the same time. It is true, that among the shareholders there are some privileges in the number of their shares, but these are the contracting directors of the bank, those who manage a business so vast and of so great responsibilities, those who guarantee to the Treasury its duties, and to their fellow-shareholders the results of their management, and who must supply, in case of deficiency of the associated capital, the necessary funds for the progress of the undertaking. The Government was convinced by its own experience, when endeavouring to establish the bank on the basis of the decree of the 18th June, 1849, that it was difficult, if not impossible, to accomplish it with partners admitted with an equal number of shares. The difficulty of their all granting their confidence to the same parties to direct the establishment; the large remuneration that these parties would then ask for managing and directing the undertaking in which, on the other hand, they would risk little or nothing; the well-grounded apprehension that with the associated capital of but \$250,000, they could not meet the necessities and emergencies of a business having to contend with great difficulties in the interior of the Republic, and especially abroad, where still existed accumulated a considerable balance of the bark exported by Pinto and Co., and of that which was so steadily exported during the last period of free egress, the very slowness with which the directing "Junta," named since August of last year, had proceeded in the convocation of shareholders and other operations belonging to its functions, since it had not even installed itself until the arrival of the Government in La Paz towards the end of last November, a slowness which caused a presumption of great delay when the attempt should be made to organize and put the bank in movement: all these difficulties, all these fears and motives were the inducement, apart from the intrinsic merit of the proposal of Messrs. Aramayo Brothers for the Government to come forward itself at once in this serious affair, and adopt a plan that under the circumstances was certainly the least evil if not the very best. Accordingly all the citizens being invited to submit their proposals upon the solemn opening of these in a Council of the Ministers, and in the presence of a large meeting of the most respectable citizens of La Paz, the unanimous opinion of the Government, the directing "Junta," and the bystanders, decided that of Messrs. Aramayo and Co. to be the most advantageous. The Government, impartial and provident in the management of the gravest national interests of which it is not owner, but administrator, accepted it with certain modifications, which were in their turn accepted by the parties proposing. Then, Sir, was it that the present National Bank of Bark was installed.

The circular of January 28th, 1850, ordered the convocation of shareholders in all the departments of the Republic, and determined the distribution among them of the 500 shares. The present number of shareholders is 80, without including the contracting directors of the enterprise; the former hold 293 shares and the latter 207. It is to be observed, that according to the contract, the directors originally were to have taken but 100 shares, and those which should remain untaken at the end of the term of the convocation, which have amounted to 107. Each share is of \$500; the enterprise consists of 500 shares, and the capital stock is \$250,000.

The Government entertains flattering hopes of the progress and advance of this establishment. It has but one foe—smuggling. The Government is striving and will strive to repress and chastise this with all the means of action conferred upon it by its authority, and imposed upon it by good faith to its

engagements) to the shareholders and the entire nation. Of the \$142,000 which annually enter into the Custom-house at La Paz for bark duties \$20,000 have been applied by a decree of the 28th January, 1850, to the work upon the cathedral of La Paz. It was to be deplored that the construction of so grand a monument of the piety and civilization of that wealthy people should be paralyzed by the scarcity of its funds, consequent on the continuance of the treaty with Peru, which has made unavailing the intentions of the law of 11th October, 1844.

The rich fiscal ingress of bark is until now wholly due to the department of La Paz, and it was just that the Treasury should remit a small part of its duties in favour of the first work of that department. The necessity of having the Custom-house operations in baling, weighing, and examining the quality of the bark destined for export, verified with the care and minuteness needed to avoid frauds prejudicial to morality and the public purse, has induced the Government to create the office of "Bark Inspector." Its salary is at present fixed at \$1200 per annum, and it has been conferred upon an individual who has merited the three-fold confidence of the Prefect, Municipal Council, and the Directors of the bank.

August 6th, 1850.

[The following document, forwarded to us after the above report was in type, appears to be alluded to in the report.—ED. PHARM. JOURN.]

ARTICLES 1 TO 9 OF THE DECREE OF THE BOLIVIAN GOVERNMENT AS REGARDS BARK.

Art. 1. Four months after this a National Company will be established for the getting and exclusively exporting bark to foreign places, in conformity with the law 14th Nov., 1834.

Art. 2. The company to be composed of such individuals as shall join it as bidders, who must be Bolivians or foreigners intermarried with Bolivians, and persons domiciliated in the Republic.

Art. 3. The funds of the society to amount to 500 per pesos, divided into 500 shares of 1000 pesos each. No one to have more than five shares.

Art. 4. The Bank only, in the name of the society, can give permission to buy or export the bark got from the mountains of the Republic, with the absolute prohibition to any other individual society or corporation on pain of confiscation, for the term of ten years, which may be lengthened as often as necessary, according to the result of the enterprize.

Art. 5. The Society of Bank of Exchange can neither buy nor export during the first two years more than 3000 quintals, in order to wait till the accumulation of the European markets is reduced; 4000 in the third year, and 5000 in the fourth and subsequent ones.

Art. 6. Amongst the quantities named in the foregoing article for the exportation of the Calisaya bark of first quality may be comprised in the first two years 600 quintals of the Charquisillo and Canuto, and 1000 in the subsequent ones.

Art. 7. For the collection of funds mentioned in Article 3, a directing junta of four individuals is to be formed, who are to be named by Government and presided over by the prefect, with the object to convoke the shareholders, and to submit the propositions and subscriptions of those who wish to belong to the Society of the Bank of Exchange or Exportation.

Art. 8. Two months after the enterprize is announced by the directing junta, and whenever it has got together a number of shares, which for the formation of the bank it shall deem sufficient, the shareholders entered into the society will be convoked. If by a majority of votes it is resolved to establish the same giving security for its responsibility, it will be considered installed. From its beginning the society will admit or receive in the two following months the subscriptions which come in until their number is complete. If after the lapse of this time the number should not be complete, the shareholders may form a

bank of themselves, taking upon themselves the responsibility of beginning anew their undertaking. No share will be admitted the term of the four said months once expired.

Art. 9. The Bank or National Society shall pay to the principal factors of Paz thirty pesos to the merchants and workers of the mountains for every quintal of Calisaya bark of first quality, twenty for Charquisillo, seventeen for Canuto of the green Calisaya, and \$30 duty on Calisaya, \$16 on others.

COPY OF THE DECREE OF THE BOLIVIAN GOVERNMENT.

Considering,

1st. That the number of bark-cutters has caused such an accumulation of bark in La Paz, that the National Bank has not been able to export or buy it at once without exceeding its annual amount, so far as to have actually in deposit the quantity corresponding to the second year, and even a part of the third.

2d. That it is the duty of the Government to protect the bark forests, menaced by imprudent and excessive cuttings.

3d. That the Government, regardless of its contracts, cannot view with indifference the immoderate cutting of bark, which lowers its value, compromising at the same time the interests of the public, of the Bank, and of the Treasury.

DECREE.

Art. 1. The cutting of the bark is prohibited throughout the republic from January 1, 1851, for the three succeeding years.

Art. 2. Bark already cut, or which may be cut up to December 31, 1850, shall be taken to the Custom-house at La Paz, by the 1st of March, 1851.

Art. 3. Bark cut after January 1, 1851, or which may be found on the road, or in any other place, after March 1st, is confiscable by the authorities, by any individual or public officer, who may take possession of it by the mere act of apprehension, having afterwards to sell it to the National Bank at the stipulated prices.

Sucre, Oct. 29, 1850.

PHARMACY IN SWEDEN.

BY DR. N. F. HAMBERG,

Assistant Professor of Pharmacy to the Royal Caroline Institution, and to the Pharmaceutical Institution of Stockholm.

As the Pharmaceutical Journal already contains various articles upon the state of Pharmacy in different countries, and as the Editor has expressed a wish to have an article upon Pharmacy in Sweden, I have very great pleasure in communicating my knowledge upon the subject, hoping, that if the notice is in some degree incomplete, it will be excused, inasmuch as it is written from memory.

In Sweden, as well as in many other countries, it has been the object of Government, by laws and other regulations, to provide that the people for a fixed moderate price, should obtain unadulterated medicines; and by means of limiting the number of shops, and preventing quacks or other incompetent persons from interfering in the Pharmaceutical trade, have secured for the Apothecaries or Dispensing Chemists (*Apothekare*) a sufficient competence.

That the attention of the Swedish Government for a long time has been directed to Pharmacy is plain, from a royal resolution passed in the year 1663, which commands the publication of a Pharmacopœia (*Pharmakopé*) and a price list of medicines (*Medicinal Taxa*). The first Pharmacopœia was published some years afterwards (1686), under the name of "Pharmacopœia Galenochymica," and about the same time a price list of medicines.

The first edition of Pharmacopœia Svecica was published in 1775, and new editions according to the progress of science from that time to 1845, which is the sixth and last edition. The Swedish Pharmacopœia is written only in Latin.

COLLEGIUM MEDICUM.—The superintendence and inspection of the Pharma-

ceutical as well as of the Medical establishments in Sweden are committed to the charge of a Collegium Medicum (*Konglig Sundhets Collegium*), whose members (*Medicinal Råd*) are nominated by the King; and every candidate for this office must be a Doctor of Medicine, whose degree has been obtained by passing an examination.

APPRENTICESHIP.—Any youth who may wish to enter as apprentice in an Apothecary's shop, must be fifteen years of age, and ought to have gone through a school-course of History, Geography, Mathematics, Latin, and Modern Languages.

ASSISTANT, OR PHARMACIÆ STUDIOsus.—The Apothecary must announce the name of the apprentice for registration in the Collegium Medicum, and provide for his instruction in Botany, Chemistry, and Pharmacy during the apprenticeship, which lasts from three to four years; and after which time the student is authorized to pass an examination in Botany, Chemistry, Pharmacy, Latin, and Modern Languages. This examination must be passed in Stockholm, in the Apothecaries' Society (*Apothekare Societeten*), and in the country before the official Physician of the province, together with the Apothecary who is the master of the apprentice. After this examination his oath is taken in compliance with the law and the official Pharmaceutical regulations, and he is now declared "*Pharmaciæ Studiosus*," and capable of exercising the functions of an Assistant in a shop, and also answerable for the prescriptions prepared by him; and by way of a check he must always sign his name to the label of the prescription.

(The apprentice or scholar is not answerable, and in consequence not allowed to prepare any prescriptions, he may sell innocent medicines only, as elder and chamomile flowers, juniper-berry, gummi acaciæ, &c.)

PHARMACEUTICAL INSTITUTION.—After serving as an Assistant in a shop for three years, and producing a testimonial of the fact, he may now enter as Pupil at the Pharmaceutical Institution (*Pharmaceutiska Institutet*) in Stockholm, and there attend the lectures which are read in Botany, Materia Medica, and Pharmaceutical Chemistry, from the beginning of October to the end of May, with a few weeks vacations at Christmas. At the same time he must work two days a week in the operations of the laboratory.

The fees for the lectures and the course in the laboratory are together about £1. The Pupil has free admission to the lectures in Zoology, Botany, Materia Medica, and Chemistry at the Royal Caroline Institution (*Konglig Carolinska Institutet*), and to the excursions of the Assistant Professor of Botany, which take place during the summer months, May, June, July, and August, in the environs of Stockholm.

After finishing the course in the laboratory, the duration of which depends upon the capacity of the Pupil, he may request a private trial (*tentamen*) by the Professors in the prescribed branches of science, viz., Botany, Zoology, Materia Medica, Theoretical and Pharmaceutical Chemistry, and Toxicology.

If he can present in the Collegium Medicum a certificate from the Professors of their satisfaction with the trial, a day will be appointed for examination, which is conducted by two Professors at the Royal Caroline Institution, and two of the Apothecaries in Stockholm before a member of the Collegium Medicum. During the examination, whoever wishes, is allowed to be present, and all the questions are registered in a book kept for that purpose, and a note made whether or not the answers are correct. And the examiners express the merits of the candidates by the following different terms: *laudatur*, *cum laude approbatur*, *approbatur*, *cum approbatione admittitur*, and last of all, *admittitur*.

The examination is not passed unless the candidate receive the approbatur of all the examiners.

PROVISOR AND APOTHECARY.—After the examinee has taken an oath before the Collegium Medicum to comply with the laws and pharmaceutical regulations, he is declared "Provisor and Apothecary," and obtains a diploma to that effect. He is now at liberty to purchase by agreement an Apothecary's shop,

if one becomes vacant, or through nomination, if a new one is required in any part of the country.

The right (*privilegium*) of dispensing medicines in a shop, properly procurable by personal permission from the Government, and which should cost only about 4 or £5 for the diploma, has become a traffic, and the price has gradually risen to such an extent, that at the present time the *privilegium*, or good-will of one of the best shops, is sold for about £3000—a sum beyond the reach of a poor though clever student.

Those who have been interested in the success of Pharmacy in Sweden, have proposed to mortgage (*amortisera*) the privileges by a loan; but their benevolent endeavours have been stranded by the difficulty of procuring so large a sum of money necessary for mortgaging the privileges over the whole of Sweden.

When a person through purchase or inheritance has become possessed of an Apothecary's shop, he must announce it in the Collegium Medicum in order to obtain from the Government confirmation of the privilege for himself.

If in any part of the country a new shop is required, the Collegium Medicum announce it, and propose three of the most deserving candidates. The Government nominates one of them. It is for the most part in country places, at a distance from any town, that new Apothecaries' shops are allowed for the convenience of the public. In the larger towns, on the contrary, they are rarely permitted.

The number of Apothecaries' shops in Stockholm is fourteen, to a population of 90,000. No new shop has been permitted during the last twenty years, as the number has been found more than sufficient. For in Sweden, as in many other countries, it is observed that the larger number of inhabitants and the fewer shops the better are the medicines.

The Apothecaries have, in consequence, a sufficient competence ensured in their calling, and are not compelled to enter into other trades. Hence it is they love their profession, and by dispensing medicines of the best quality, strive to obtain the confidence of the authorities and the public. On the contrary, if the number of shops is very large—or, still worse, unlimited—the Apothecary or Chemist cannot gain a subsistence from his profession, and is, therefore, obliged to seek in other trades what he cannot find in his own; and Pharmacy, instead of being the main object, is reduced to an insignificant rank, and reflects no credit upon its followers.

Under such a system, if each Apothecary train up one or more Assistants, the number of candidates for shops will in time become extravagantly large, and the difficulty of controlling them increases in the same proportion.

(Some of the Apothecaries in Sweden have endeavoured in consequence, to employ Assistants only, and no Apprentices, in order to obviate too great competition).

THE APOTHECARIES' SHOPS (APOTHEK).—The shops in the towns are for the most part large, and internally are often arranged with considerable elegance. The laboratory, according to the regulations, must contain a steam apparatus for preparing decoctions, extracts, aromatic oils and waters, &c.

Decoctions and infusions must be prepared *extempore*.

Tinctures must be kept in a room in which the temperature is not under 15° Celsius, in order that the dissolved materials may not be precipitated by the cold.

Native vegetables must be renewed every year, and the old stock destroyed.

The best medicines, if there are several kinds in commerce, must always be written for.

Every shop has a sign of its own, derived from some animal or other object. To each medicine prepared according to a prescription must be attached a label, on which is the name of the shop.

The so-called homœopathic Apothecaries' shops do not exist in Sweden. They are not necessary, inasmuch as homœopathy does not seem likely to be long-lived there, and will soon become an historical curiosity. It is very probable—indeed, I believe it—that in Sweden as in other countries, many

hysterical ladies, or *malades imaginaires*, male as well as female, have perhaps derived comfort from the potential homœopathic sugar-grains and interesting conversations with the homœopathic long-suffering Physician. But Swedes, in general, do not like this kind of medicine; no foreign, and only one Swedish Physician practises homœopathy in Stockholm, and, in the country, I believe, not a single one.

PRESCRIPTIONS (RECEPTER) AND THE PRICE-LIST OF MEDICINES (MEDICINAL TAXA).—The Chemist must put on every prescription the price, which must be according to the rate of the price-list at that time. The Swedish price-list of medicines is revised every year, and the price of medicines is changed according to the market price of the drugs.

Medicines for external use ought to have a coloured label, and powerful medicines are to be sealed.

The Chemist must prepare medicines according to the Swedish Pharmacopœia, unless the Physician has (*expressis verbis*) prescribed otherwise. The Chemist is forbidden to prepare prescriptions of other than Physicians who are allowed to practise in Sweden; and a list of them is every year published by Collegium Medicum.

As a Physician is not allowed to keep an Apothecary's shop, because he has no Pharmaceutical diploma, so the Chemist is not allowed to practise in medicine: the privilege of that is granted only to such persons as have gone through a complete medical course at any of the Swedish Universities in Upsala or Lund, or at the Medico-Chirurgical Academy of the Royal Caroline Institution in Stockholm. To gain admission into the last-mentioned Academy, the student must have passed at some of the Universities a philosophical and philological examination.

Foreign Physicians, unless they can present a diploma as Doctor of Medicine from a well-known University, are not allowed to practise medicine in Sweden without a so-called colloquium familiare in the Collegium Medicum, or medical course at the Royal Caroline Institution.

As the time of the Apothecary is not employed in medical practice, and as his competence is sufficient, he can, if he loves science, employ his spare hours with tranquillity in working in that branch of science which he most affectionately embraces.

If, in general, a greater scientific activity of the Pharmaceutical profession in Sweden is to be desired, we must, however, with pleasure remember that private individuals, distinguished in other countries for original scientific researches, have been met with and are still to be found in Sweden. I will only here mention the most distinguished:—For about a century ago lived in Köping (a very small, and, for the greatest part of the world, unknown town in Sweden) an Apothecary and Chemist, who, with great eagerness, was labouring in Chemistry. The good burghers in Köping very likely thought him a clever Apothecary, but none of them could foretell that their diligent friend the Chemist, *Carl Wilhelm (Charles William) Scheele*, in his small insignificant shop, was operating with experiments the result of which should astonish the whole scientific world.

INSPECTION OF THE SHOPS.—The Chemists' shops in Sweden must, according to the regulations, be inspected every year. These inspections are performed in Stockholm by two professors or assistant-professors to the Royal Caroline Institution, in presence of two Members of Collegium Medicum, and in the country of the official Physician of the province, together with a magistrate.

As the official Physician of the province has not time enough for Pharmacognosy, the Collegium Medicum has of late proposed to the Government a change in inspecting the shops in the country, so that, as in some part of Germany, the whole country will be divided into a certain number of districts, and every district obtain a travelling inspector.

Should the inspector find any adulterated or bad medicine it must be immediately destroyed.

If an Apothecary is three times found to have sold adulterated medicines, he directly loses his privilege, and must give up his shop to another person.

It is at the same time a duty and a satisfaction for me to state, that medicines in Sweden are commonly very good, and when adulterated articles are met with are usually such as are imported.

Poisons, or other noxious medicines, which in the Swedish Pharmacopœia have this mark Φ , must not be sold without a sufficient prescription, which ought to be retained by the Chemist, and not repeated without a note from the Physician.

Poisoning is, consequently, very rare in Sweden, and when practised it is commonly by means of white arsenic, which has probably been obtained from a glass manufactory.

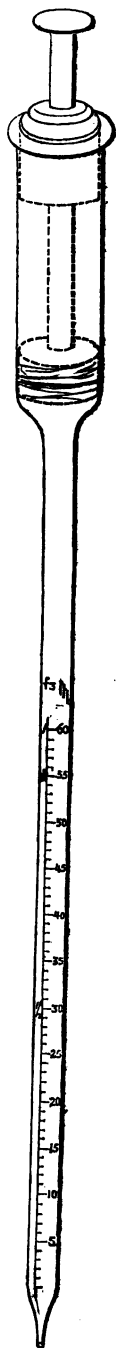
Secret medicines are forbidden in Sweden, in spite of which charlatans try to sell secretly their all-relieving medicines, but they seem more and more to lose the confidence of the public, and their credit, too, sinks in the same proportion as the reputation of the scientific Physician increases.

ASHTON'S MINIM METER.

THE annexed cut represents on a reduced scale, a minim meter, introduced by Mr. Ashton, of Cavendish Square. It is an improvement on the one contrived by Mr. Alsop, and figured in our first volume, page 326. The improvement consists in the removal of the piston from contact with the surface of the fluid in the tube, by which means the packing of the piston is not contaminated by tinctures, essential oils, &c., or injured by acids, alkalies, or other corrosive liquids. This is effected by the enlargement of the upper end of the tube in which the piston works. The length of the piston-rod being diminished in proportion to the increase in the diameter of the tube, the dispenser can more easily use the instrument with one hand, holding it between the thumb and third and fourth fingers, and raising and depressing the piston with the first and second. The increased diameter of the piston admits of more accuracy in the packing, which may be either moistened with pure water or lubricated with grease, the intervening space separating it completely from the fluid in the graduated portion of the tube.

The diameter of the lower part of the tube is so adjusted that one inch contains ten minims, six inches containing a drachm; and a space of not less than an inch or inch and half should intervene between the graduated portion of the tube and the bottom of the piston when depressed. In using the instrument care should be taken not to raise the piston with a jerk, otherwise bubbles of air are drawn in. Before using it the piston should be raised about a third of an inch to ensure the inclusion of a sufficient volume of air to force out the liquid measured, and the piston should never be raised so high as to bring the liquid in the tube above the graduated portion.

The superiority of this instrument is so obvious that it is likely to supersede the old-fashioned minim measure, and we hope it will assist in promoting the general substitution of minims for drops, the variable size of which is notorious.



DR. JAMES ARNOTT'S LOCAL ANÆSTHETIC AGENT.

DR. JAMES ARNOTT has suggested a means of producing temporary insensibility during operations by the application of cold. Two pounds of pounded ice and one pound of common salt are mixed and applied to the part affected, in a bag or piece of stout calico attached to a ring. The intensity of the cold destroys for the time the sensibility of the part. Experience will show whether any unfavourable effects result from the reaction.

WARBURG'S FEVER TINCTURE.

As discussions are now going on in the Medical journals respecting the efficacy of this nostrum, it may not be improper to remind our readers that the nature of this preparation was pointed out in the *Pharmaceutical Journal* for September, 1849 (vol. ix., p. 134). Its most effective constituent appears to be sulphate of quina.

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(Continued from page 161.)

AUSTRIA.

AUSTRIA abounds in every description of metal. All the more useful kinds, with the exception of platinum, are to be found therein, and in the production of the precious metals, Austria is surpassed by Russia alone. Transylvania is one of the richest countries of Europe in gold; Hungary, also rich in gold, is still richer in its yield of silver. Bohemia ranks next to Hungary in this respect, and then Transylvania. Bohemia supplies excellent tin, Corinthia the purest lead, and Hungary is extremely rich in copper. Iron is produced throughout the countries of this empire, with the exception of Görz, Gradisca, Illyria, and Venice.

Minerals, metals and their ores, and chemicals, are among the things which Austria has contributed to the Exhibition.

Mercury and Cinnabar, and Ores of the same, from the imperial mines, Idria.

A large quantity of mercury is annually produced at Idria, a town in the duchy of Carniola, the inhabitants of which are chiefly occupied in its extraction. The mines are extremely productive, and the ore when very rich, yields 50 per cent. of the metal. The exports of mercury from this part, amount to an annual average of 2341 cwt., besides about 41 cwt. of mercurial compounds, such as corrosive sublimate, calomel, &c. The mines have been worked for upwards of three centuries and a half.—R. E. Illustrated Catalogue.

Mercury is also exhibited by the Upper Hungarian Mining Association, from Schmöllnitz, Hungary.

Copper.—*Rosette copper* from Agordo, in the province of Venice and Moldavia, and *refined, blistered, and block copper*, from Schmöllnitz, in Hungary.

The copper found in Austria does not equal the Russian or the Swedish copper in quality, and therefore, although much of the Austrian copper is exported, copper of superior quality is imported into Austria from other countries.

Tin, from Schlaggenwald in Bohemia.

The quantity of tin found in Austria is not equal to the demands of the country for it, the imports of it being nearly 3000 cwt. more than the exports.

Litharge from Pzribram in Bohemia, *Zinc* and *Antimony*.

Cobalt and Nickel Ores, from Bocza, together with the residue obtained from the same, exhibited by J. F. Szumrak, of Neusohl, Hungary.

Nickel Ores, from the Philippi Jacobi mine, by Alexander Sapy, Rosenau, Hungary.

Nickel and Cobalt Ores and Flowers, from Zemberg mine, Dobschan, and from Johannes mine.

Spongy Nickel from Hungarian ores, and *Red and Black Oxides of Cobalt*, from Pesth.

The ores of cobalt and nickel have only recently been obtained on a large scale in Hungary, the mines having been in work only for a few years.

Ores of Uranium, Vanadium, Nickel, Cobalt, &c., by Batka of Prague.

The oxides of uranium are employed for enamel painting, and also for producing

a beautiful greenish-yellow tint in glass. The metal is rare, occurring principally in uranite and pitch-blende.

Vanadium occurs still less abundantly in some ores of iron.

Antimony and Antimony Ores, from Rosenau, Metzenseifen, and Rosenberg, in Hungary.

Arsenic Ore, and White and Yellow Arsenical Glass, from Salsburg.

Sulphur is exhibited from two or three localities in Austria, and it appears that it is found abundantly although not sufficiently so to meet the demands of the country.

Among the chemical compounds exhibited are sulphate of iron, alum, cream of tartar, tartaric, acetic, and arsenic acids, chloride of lime, salts of potash, oxides of chromium and uranium, stannate of soda, ferrocyanide of potassium, succinic acid, &c. The specimens are not remarkable.

STATES OF THE GERMAN ZOLLVEREIN.

The Zollverein, or Great Custom Union, was constituted in 1828. It consists of twenty-six Germanic States, embracing two-thirds of the German territory, and occupied by twenty-nine millions of inhabitants.

Among the specimens exhibited from this district are many chemical preparations, metals, ores, and other minerals, some of which are highly interesting.

Iron in different states, and *slags*, from the process of refining the metal by gas.

The process of refining iron by gas consists in driving carbonic oxide through the melted mass, by which the carbon is more effectually removed.—R. H.

Several varieties of *Calamine*, and of *Zinc* and *Cadmium* obtained therefrom.

The territory of the Zollverein is the principal producer of zinc, and the ore frequently contains cadmium associated with it. The most extensive zinc works in the world are those of Silesia, and the mode of manufacturing the metal here is different from that adopted in other countries.

Arsenic and Gold, together with the washed and unwashed ores, illustrating a process of which, out of the residue of the arsenic ores, the gold therein contained is eliminated. The process is founded on experiments of Professor Plattner's, of Freiburg.

Cinnabar, or Vermillion, is exhibited by Du Bois, of Hirschberg, and Lucas, of Kunersdorf.

E. E. COCHIUS, *manufactory of chemical products at Oranienburg*.

Large specimen of ferrocyanide of potassium, to be sold at 14 sgr. to 15 sgr. the pound, 1s. 6d. per pound, or £110 for the group of crystals. The manufactory produces every year from 250,000 to 300,000 pounds.

This is a very large group of crystals, but the colour is not so good as that of some other specimens in the Exhibition.

DR. LOUIS KUNHEIM, *owner of a manufactory of chemical preparations, Bergmannstrasse 2*.

Various chemical preparations, viz., sal-ammoniac, acetate of lead, acetate of soda and ditto of lime, concentrated vinegar, nitrate of lead, blue vitriol, sulphate of copper, pink salt, phosphate of soda, cyanide of potassium, chloride of tin, bichloride of tin, oxide of tin, protoxide of copper, wolframic or tungstic acid, &c.

D. F. & C. L. TESSLER, *Stolp*.

Two pieces of raw yellow amber, as cast up by the sea, of unusually large dimensions. Specimens enclosing insects. Piece of wood of the amber tree, and specimens of the raw amber, as found under ground, and thrown up on the shores of the Baltic.

From the researches of Dr. Karl Thomas, it appears that under a nearly horizontal stratum of alluvial sand and coal-bearing clay, on the Samlandic coast, lies a stratum of amber earth. This has been explored where it rises above the level of the sea, and carbonized coniferous wood is found in it with organic remains. From the amber-bed on the coast of Dirschkeim, extending under the sea, a storm threw up, on 1st January, 1848, no less than 800 lbs. The amber "fishery" of Prussia formerly produced to the king about 25,000 crowns a month. After a storm, or an unusually high tide, the amber coasts are crowded with gatherers. Large masses of amber are occasionally cast up by the waves.—R. E.

L. BLEIBTREU, *owner of the alum-works on the Hard, near Bonn*.

Two cylindrical blocks of alum—the raw material is brown coal, containing iron pyrites, per 50 kilogrammes, 4 dolls. 2½ sgr.

The Rhenish alum is usually conveyed in crystallized blocks, resembling casks, without any external covering to protect them.

The tertiary beds on the banks of the Rhine, near Bonn, contain large masses of lignite, in which is potash and a certain proportion of iron pyrites. These beds are interstratified with clays consisting of nearly pure alumina. The sulphuric acid, alumina, and potash, required for the manufacture of alum, are obtained by burning together the pyritous wood and the aluminous earth. A double decomposition takes place during the combustion, the iron being left in the shape of protoxide, colouring the ash, while the double sulphate of alumina and potash is produced. The burnt ashes being soaked in water, the alum is dissolved out and afterwards purified.—D.T.A.

BISCHOF & RHODIUS, at Linz, owner of the white lead works at Burghbrohl.

Four pieces of ceruse, with two pieces broken in two, per 100 pounds, 11 dolls.—four pieces of hard white lead, with two ditto, per 100 pounds, 9 dolls.—one piece of soft white lead, per 100 pounds, 8 dolls. 15 sgr.—one piece of white zinc, with one broken piece, per 100 pounds, 9 dolls.

Zinc white, or oxide of zinc, is being introduced as a substitute for white lead in painting. It is made by sending a current of hot air over the surface of the melted metal. It possesses the advantage of not being discoloured by sulphuretted hydrogen, and is therefore peculiarly applicable for painting chemical laboratories.—Ed.

A. WIESMANN & Co., owners of the *Augustenhütte* factory near Bonn. Agent at London J. F. KLEIN, 38, Finsbury Square.

Various productions of slate-coals, viz.—2 bottles of mineral oil, specific weight 0.800 and 0.850—1 bottle of paper-coal—1 ditto of paraffine—1 ditto of "Glühlack"—1 ditto fossil black.

Branch mining company of BREDT & Co., in Stolberg. At the mines "*Büsbacherberg*," "*Contentment*," and the zinc-works, "*Steinfurth*."

Ores of zinc and lead. Willemite from the mine Busbacher-Berg. The crystals have a density of 4.13, and a hardness between 4 and 5. Their composition is $3\text{ZnO} + \text{SiO}_2$. Calamine from the mines Busbacher-Berg and Zufriedenheit. Zinc from the foregoing ores. Chlorophosphate of lead, and lead from the chlorophosphate.

Association for the manufacture of white lead in Stettin, by their partner, H. GRÜNEBERG, chemist. Agent in London, C. KÉKULÉ, 60, Mark Lane.

A specimen of white lead, made by a process patented by H. Grüneberg, the advantages of which over the present process consists not only in its extreme cheapness, but in the fine colour it imparts. This white lead is taken from metallic lead found in the Harz mountains.

W. O. WALDTHAUSEN, manufacturer of ceruse and white lead, Clarenberg, near Cologne.

A case with white lead from the above-mentioned works, obtained only by means of moist steam and gases on the Klagenfurt plan, without the help of manure, by which method not a single case of painters' colic has taken place among the workmen, per 100 pd. 8 dolls. 15 sgr.

BRASSEUR & Co., at Cologne, owners of the white lead manufactory at Nippes, near Cologne.

A case containing leaden plates with the oxide and specimens of white lead, per 107 pounds, 7 dolls. 10 sgr.—The oxydated plates are worthy of observation on account of their perfect condition. The white lead is manufactured by steam power, in the Dutch manner, and by means of a machine invented by the exhibitor, not injurious to the health of the workmen.

O. HERRMANN, chemical manufactory (formerly royal) at Schönebeck.

White oxide of zinc, iron alum, red prussiate of potash, pure carbonate of soda, hyposulphate of soda, chlorate of potash, cyanide of potassium, pure carbonate of potash, dry nitrate of strontia, crystallized nitrate of baryta, chloroform, bromine, tin-salt, pure gallic acid, crystallized tartrate of potash, pure oxide of copper, sub-nitrate of bismuth, succinic acid, glacial phosphoric acid, potassium, sodium, cadmium.

The glacial phosphoric acid is beautifully transparent and perfectly colourless, and most of the other preparations appear to be remarkably good.—Ed.

Chemical manufactory of STOHMANN & WÜSTENFELD, Neusalzwerk.

Pure sulphate of zinc, per pound, $3\frac{1}{2}$ sgr.—Various Acids: acetic acid (1.040 and 1.060), phosphoric acid, chloroform (1.500) per pound resp. 26 sgr., and 1 doll. $13\frac{1}{2}$ sgr., and 1 doll. 25 sgr.—Nitric, sulphuric, purified hydrochloric acid (1.120), 100 pds.

resp. 10, 12½ and 5 dolls.—Carbonate of soda (99, 95, and 90 per cent. Décroigilles), 100 pounds 7, 6½ doll., and 6 dolls. 5 sgr.—Ditto crystallized, pure crystallized, and sesqui-carbonate of soda, 100 pounds resp. 2 dolls. 25 sgr., 10 dolls. and 8 dolls.—sulphate of soda, 100 pounds, 1½ dolls. and 2 dolls.—ditto purified, 100 pounds, 4 dolls, 15 sgr.—Subsulphite of soda, per pound, 8 sgr.—Nitrate of soda, 100 pounds, 11 dolls.—Seignette salt, per pound, 7½ sgr.—Acetate of potass, purified, per pound, 27½ sgr.—Carbonate of potass, 100 pounds, 14 dolls. and 30 dolls.—Ditto, purified, per pound 1 doll.—Prussiate of potass per pound, 20 sgr.—Sulphate of potass, 100 pounds, 9½ dolls.; crystallized, 40 dolls.—Cyanide of potassium, after the suggestions of Liebig, per pound, 1 doll. 10 sgr.—Soda-salt of the salt water of Rehme, 100 pounds, 3 dolls. Mother-lye of the same, 180 quarts, 5 dolls.—Bleaching-powder, 100 pounds, 6 dolls. Sulphate soda, 1000 pounds, 2 dolls. 5 sgr.

J. F. HEYL & Co., proprietors of a chemical and colour establishment in Charlottenburgh, and of another for acetic acid at Finkenhausen, in Pomerania, Leipzigerstr. 75.

A sample of pure acetic acid of 100 pounds 7° Baume 12 dolls.—Ditto, with three pounds of acetate of soda, the 100 pounds 10 dolls.—Ditto, with three pounds of pyro-acetate of soda, the 100 pounds 10 dolls.

Administration of the Royal Alum Works, Schwemsal, district of Bitterfeld.

Refined potash alum, crystallized in form of a cask, for 1½ centner nett amount 10 dolls. 6½ sgr.—Ordinary potash alum, crystallized in the shape of a cask, for 1½ centner nett amount 7 dolls. 17½ sgr.—Sulphate of alumina, passing in trade under the name of "aluminate," containing but little iron, applied to the fabrication of paper, and might be employed with advantage in tanning white leather, per centner 4 dolls. 22½ sgr.

Royal salt-office at Durrenburg, near Merseberg. The pressing engine by the engineer, A. MILCH, of Cologne.

Common salt (in 2 bottles), as obtained in the salt-works of Durrenburg and retailed to the public.—Brown coal (5 pieces), shaped by a pressing engine, and employed as fuel in the boiling of the salt-water.—Bottle with earthy brown-coal, of which the above bricks are compressed.

Royal Salt-office at Schönebeck.

One sample of common salt of fine grain and one of middling grain, obtained by graduation of refined brine at the Royal Salt-works of Schönebeck.

Royal Salt Works at Arterne.

Melilite, common salt, mother-lye and rock-salt; a drawing of the profiles of the bores into rock-salt.

DR. L. C. MARQUARDT, at Bonn, owner of chemical works in the valley of Bonn.

Chloroform, per pound 2 dolls. 4 sgr.—Cyanide of potassium per pound 1 doll. 16 sgr. Exhibited on account of their perfect purity.—Carburet of sulphur (the manufacture of this article is very large.)—Acetum concentratum, pure, per 100 pounds 12 dolls.

GUTHRIE & Co., at Düsseldorf.

One piece of ferrocyanate of potassa.

E. MATHES & WEBER, Duisburg.

Various chemical productions, viz.: hydrochloric acid, bleaching powder, sulphate of soda, soda (crystallized, calcined and caustic), per 50 kilo., 12 sgr.

WILH. GRÜNE, jun., chemist and director of a chemical laboratory for dyeing and printing, Köpnickestr. 18, 20.

Six bottles of a new invented composition for dyeing wool, in flocks, yarn, and weavings, in one bath and operation without previous boiling and etching. The invention to be sold.—A pattern-card with woollen-yarn dyed in this manner in ponceau, crimson, pink, yellow, green, violet, black, and other colours.

A. MOTARD & Co., manufacturers of German wax-candles, vor dem Halleschen Thor 6.

Stearic acid, obtained from tallow, by the use of lime, sulphuric-acid, cold and warm pressure, the centner 34 dolls.—Candles made of this stearic acid, the centner 40 dolls.—Stearic acid from tallow by the use of sulphuric acid and by distillation, without pressure, the centner 34 dolls.—Stearic acid, cold and warm pressed, the centner 34 dolls.—Candles made of this stearic acid, the centner 40 dolls.—Stearic acid from palm oil, by the use of sulphuric acid, and by distillation without pressure, the centner 22 dolls.—Candles made of this stearic acid, the centner, 25 dolls.—

Candles made of this stearic acid, and plated with a better kind, the centner 30 dolls.—Stearic acid from palm oil by sulphuric acid, distillation, warm pressure, the centner 34 dolls.—Candles made of this stearic acid, the centner 40 dolls.

Bonz & Sons, at *Böblingen*.

Creosote and hydriodate of potass.

O. PAULY, owner of the chemical works, *Rüppurr, near Carlsruhe*.

A group of crystals of ferrocyanate of potass (yearly production of factory 80,000 kilogr.), a plate of sal ammoniac (annual produce 20,000 kilogr.), a bottle of phosphorus (annual produce 4000 kilogr.).

K. OEHLER, chemical works at *Offenbach*.

Pure chemical and crystallizing creosote, light coal-oil, resin-naphtha, asphalt-varnish for covering iron, wood, &c.—Two bottles of refined lamp and Paris-black, for copper printers and lithographers, and for varnishing the finest sort of leather.—One bottle with pure crystallized sal ammoniac.—Two specimens of asphalt-paper for packing goods, which should be kept dry.

There are two specimens labelled creosote among these preparations, one liquid, the other in crystals. The former appears to be a very fine specimen of the substance known as creosote; it has scarcely become at all discoloured by the long exposure to light to which it has been submitted. The specimen labelled crystallizing creosote, is probably carboic acid in the solid state. Liebig says of this acid, "it has a very strong and peculiar smell, so closely allied to that of creosote, if not identical with it, that it is difficult to suppose them to be distinct substances."—Ed.

C. ZIMMER, at *Frankfort on the Maine*.

Pure crystallized chinidine (quinidine). The sulphate of this alkaloid is contained in sulphate of quinine, manufactured from the ordinary sorts of yellow bark; but it is only lately that it has been produced separately as a salt, and its properties satisfactorily ascertained.

For an account of chinidine or quinidine, see vol. vii., page 527 of this Journal.—Ed.

F. J. BRÖNNER, at *Frankfort on the Maine*.

Kreosote, pure and refracting light powerfully, per pound, 1 doll. 22 sgr.

This specimen has become very much coloured from exposure to the light.—Ed.

E. KIRSTEIN, merchant in *Hirschberg*.

Drugs collected in the neighbourhood of Hirschberg, viz.—Iceland-moss, per centner 3 dolls. 15 sgr.—Dried bilberries, per centner 3 dolls. 17 sgr.—Lavage, per centner 12 dolls.—Hellebore, per centner 8 dolls.—Valerian, per centner 10 dolls.—Angelica, per centner 9 dolls.

GOTTSCHICK, at *Agenbach, near Calw*.

Dried bilberries, as a preventive of the attacks of cholera, per pound 15 kr.

SCHUON, at *Dobel, and M. PFEIFFER*.

Dried bilberries, as an excellent preventive of attacks of the cholera, per pound 15 sgr.

J. L. F. SCHRAMM, Chemist, *Dessau*.

A cartoon of sixteen flasks, with oil for watches, prepared out of vegetable substances. A watch provided with the same, retains, if hung up in the open air, at a temperature of 16° Réaumur, its undisturbed motion. 100 flasks 25 dolls.

Salt-work at *Theodorshalle, near Kreuznach*.

Samples of common salt-crystals, remarkable for their size, and one bottle with concentrated mother-lye for baths, particularly efficient by the considerable quantity of bromide and chloride of calcium it contains.

BUSCH, P. A., *Frankfort on the Maine*.

Rectified cognac oil, manufactured out of common gin or diluted spirits.

F. A. BECKER, SAPP, & Co., *Fredeburg*.

Pieces of extraordinary-sized amadou. Best, middle, and common qualities of yellow and black amadou.

Amadou is prepared from a fungus, or species of mushroom, the *Boletus ignarius*, which grows on the old trunks of some trees, as the oak, ash, &c. The portion used is that underlying the outer bark, and overlying the ligneous matter. It is cut into thin slices and beaten, then boiled in a strong solution of nitre; dried and beaten,

and once more boiled in the nitre solution. Black amadou is impregnated with gunpowder. The fungus is used in surgery for stopping hemorrhage.—W. D. L. R. GIESSLER, *Trocktelborn*.

Balls of woad, prepared from pure woad leaves.

The Dyers' woad, *Isatis tinctoria*, is a perennial plant, which belongs to the natural order Cruciferae. The juice of the leaves contains a blue colouring matter, which has long been used for dyeing, and it is said the Ancient Britons employed it for painting their bodies.—Ed.

[The four following Articles refer to Inventions or Improvements for which the Council Medal was awarded.]

MR. W. LONGMAID'S PROCESS FOR TREATING ORES AND MINERALS—FOR SEPARATING THE METALS—AND FOR THE MANUFACTURE OF ALKALI AND CHLORINE.

In the year 1839, owing to changes in the commercial policy of Sicily, whence the main part of the sulphur used in the manufacture of sulphuric acid in this country had previously been procured, attention was strongly directed to the separation of sulphur from the metallic ores of this country, in which it exists; and it was soon found that this useful substance might be advantageously disengaged from iron pyrites. Whilst investigating this subject, Mr. Longmaid, by a series of consecutive experiments (upwards of 2000 in number), was led to the discovery of several very important facts relative to the manufacture of soda and chlorine, and the separation of certain metals from the ores in which they were contained.

Ordinarily, soda and chlorine are manufactured by decomposing common salt with sulphuric acid, producing sulphate of soda and hydrochloric acid. The former is decomposed by the action of carbon and lime in a reverberatory furnace, producing crude soda, which, being subjected to the action of carbonic acid forms carbonate of soda, the ordinary commercial soda. Bin-oxide of manganese is treated with the hydrochloric acid, and chlorine is evolved, for the manufacture of bleaching powder, and other compounds of chlorine.

In the process of smelting copper ores, for the purpose of obtaining metallic copper, a large portion of the sulphur and other volatile matters is driven off to waste at the several calcinations; a considerable waste of tin and copper also occurs when these metals are found combined in the same ores, whilst the silver existing so universally in copper ores is almost entirely lost.

Mr. Longmaid's improved process is as follows:—A given quantity of copper ore and rock salt, to which a small quantity of oxide of iron is added, are ground fine and submitted to the action of heat, in a furnace of a peculiar construction. The product of this treatment termed "sulphate ash," is a mixture of sulphate of soda, soluble salts of copper and silver, insoluble oxide of iron and tin, with a small portion of undecomposed salt, and the silica of the ore. This sulphate ash, whilst still hot, is placed in large vats and lixiviated with water; the strong liquor thus obtained is run off into other vats, where, at a temperature of 150° Fah., the precipitation of the copper and the silver is effected by means of old iron. The liquor free from copper, is now run in measured quantities on to a weighed quantity of lime, previously placed in a black ash furnace, after which the process proceeds as in the ordinary mode of manufacturing soda. At St. Helen's, Lancashire, where this process is applied on a commercial scale, the copper and the silver are precipitated together; the copper is afterwards oxydized, and used for the manufacture of sulphate of copper, in which case the silver remains as a residual product (mixed with some portion of oxide of iron), varying from 500 to 2000 ounces per ton of residuum.

The precipitated copper tests from eighty to ninety-five per cent. pure copper, the impurities consisting of oxide of iron and sulphate of lime, the latter arising from the impure water used at St. Helen's. The copper may, however, be precipitated in a state of greater purity.

When the ore contains tin, the refuse is washed as in dressing tin ore and calcined, by which means the oxide of tin remains unchanged, except that it is freed from the copper, sulphur, and arsenic, &c., with which it was mechanically combined in the ore.

The iron in the ore is converted, during the process, into salts of that metal, and subsequently it is reduced to the condition of oxide, useful for many purposes. The manufacture of bleaching powder is performed as follows:—A furnace is partially charged with calcined sulphate ash, and a current of dry air passed in contact with it; the chloride of iron is decomposed, forming oxide of iron and chlorine, the latter of which, being evolved, is passed into a chamber containing hydrate of lime. Bleaching powder is thus produced. The residuary oxide of iron forms when washed, dried, and ground with oil, a pigment of a rich purple brown tint of great durability. A black paint, useful for marine and other purposes, may be obtained by heating the oxide of iron with carbonaceous matter in a closed retort, and grinding the black residue with oil.

The raw materials used in the process are chloride of sodium, metallic sulphides (containing copper, silver, tin, iron, sulphur, and other matters), carbonate of lime and coal.

The products are copper, silver, tin, iron, sulphur, sulphate of soda, carbonate of soda, hypochlorite of lime, and oxide of iron.

The chemical changes effected are as follows:—The mixed ore and salt being exposed to the united action of atmospheric air and heat a mutual decomposition ensues. At first the oxygen, uniting with the sulphur, forms sulphuric acid, which, in its nascent condition, reacts on the salt, the sodium taking oxygen at the same time, which, combining with the sulphuric acid, forms sulphate of soda; a portion of the chlorine of the salt thus liberated, combines with the metals of the ore, forming chlorides more or less fixed. If arsenic be present it readily unites with the chlorine, and in this condition it not only becomes extremely volatile, but is also from its great affinity for water readily condensed. Chlorine and iron having combined, this product next undergoes decomposition; the iron taking oxygen forms the oxide, whilst the chlorine is evolved free, and under the conditions above described, fit for the manufacture of hypochlorite of lime, and other compounds of chlorine; the oxide of tin meanwhile passing through the several processes, remains with little loss in the insoluble residue, chemically unchanged. The chlorides of copper and silver being more stable compounds than chloride of iron, they remain in that condition after the chloride of iron has been decomposed, in which state they are readily separated from their solution by the action of metallic iron. In decomposing the carbonate of lime to produce caustic lime, large volumes of carbonic acid are evolved. This is used to combine with the soda forming the carbonate of soda. Sulphate of soda, caustic lime, and coal are mixed together in the process of manufacturing alkali. On the mixture being exposed to a current of heated air, the coal ignites, and taking oxygen from the lime, sulphuric acid, and soda, produces carbonate and caustic soda, and sulphide of sodium and calcium. The solution obtained from this product is brought into contact with the carbonic acid of the lime-kiln, which readily unites with the soda, decomposing the sulphide of sodium, and thus forming the soda of commerce.

Mr. Longmaid states the advantages resulting from the use of these processes to be as follows:—1. The saving of at least four pounds per ton in the manufacture of soda, which, taking the annual production of this alkali in Great Britain at 120,000 tons, would give £480,000. (2.) The recovery of the silver lost in the copper smelting works, which, at a moderate estimate, he calculates at 1,500,000 ounces. The saving effected in the smelting charges on copper, the recovery of the tin, oxide of iron and chlorine are also very important items in the account. Mr. Longmaid estimates the aggregate advantage at £1,000,000 sterling per annum, besides bringing into use large quantities of ore too poor to be worked on the present plan, and benefiting the general trade, commerce, and agriculture of the country, by the reduced cost at which the soda is thus produced. We may mention, that in addition to the works at St. Helen's, which are capable of treating from 8,000 to 10,000 tons of ore annually, similar works are in course of erection on the Tyne.

COUNT F. DE LARDEREL'S PROCESS FOR OBTAINING BORACIC ACID.

THE skill and enterprise of Count de Larderel in turning to profitable account the valuable products of the boracic acid lagoons of Tuscany, have been so fully detailed at page 93 of the tenth volume of the *Pharmaceutical Journal*, that we deem it unnecessary to do more than call the attention of our readers to the very interesting

and important particulars there furnished of the manufacture of boracic acid. The greater part of the borax of commerce is obtained from the saturation of this acid with soda. The average annual importation of boracic acid into this country is about 2,300,000 lbs.

M. J. B. GUIMET'S PROCESS FOR THE MANUFACTURE OF ARTIFICIAL ULTRAMARINE.

PREVIOUS to the year 1828, all the ultramarine in use was obtained from the *Lapis lazuli* or *lazulite*, a rare mineral procured from Siberia. A common ultramarine thus obtained is, at the present time, sold at seven guineas per ounce, and the price of a genuine and very choice article is upwards of twenty guineas per ounce. From its great costliness, the use of this pigment is confined entirely to the artist. Several analyses of ultramarine were undertaken with the view of finding out a method of making it artificially. These analyses showed it to be a compound of silica, alumina, sulphur, and soda, but the supposed colouring principle for some time evaded all attempts at its detection. At last M. Guimet, of Lyons, in the year 1828, aided by these analyses, and encouraged by the offer of a prize of 6000 francs from the *Société d'Encouragement* of Paris to the person who should succeed in the manufacture of artificial ultramarine, hit on the happy idea of giving up further search for the hidden colouring principle, and confined his attention to the combination of the several colourless ingredients which chemical analysis pointed out as the constituents of natural ultramarine. The result was the discovery of artificial ultramarine. M. Guimet kept his process a secret, selling his ultramarine at 42s. per pound. Gmelin, Persoz, and Robiquet afterwards discovered the process, and published the mode of preparing this pigment, since which time its manufacture has extended in Germany and in France, and has latterly been introduced into this country.

Ultramarine appears to be a compound of silicate of alumina and silicate of soda, with sulphuret of sodium, and the colour is supposed to be due to the reaction of the last constituent upon the former two. It may be prepared, according to Gmelin, by rapidly igniting a mixture of equal parts of silica, carbonate of soda, and sulphur, first adding a sufficient quantity of a solution of soda to dissolve the silica. The result is a bluish-green mass, which, by ignition in contact with air becomes blue. Ultramarine is now sold as low as *fifteenpence* per pound. It is applied to various purposes in the arts, such as paper-staining, the *azurage* or blue tinting of writing papers, starch, ground white lead, &c., and has recently been applied to the printing of cotton goods. It has superseded smalts in many industrial purposes, but as it is not an enamel colour, its employment is not applicable in the colouring of china and earthenware.

MM. PRAT AND AGARD'S IMPROVEMENTS IN THE MANUFACTURE OF SALT.

THE processes for which a Council Medal has been awarded to MM. Prat and Agard, of Aix, Bouches-du-Rhône, France, were patented in this country in 1848. They consist of an improved method of manufacturing common salt from brine and from rock salt.

In the manufacture of common salt from brine, chloride of calcium, or chloride of magnesium is added to the brine, by which addition the saline solution may be concentrated by heat to a considerable extent, without any deposition of salt therefrom taking place whilst in a heated state. This concentrated solution, when transferred to shallow vessels, deposits crystals of common salt on cooling. By this addition of chloride of calcium, or chloride of magnesium, the brine may be concentrated to the extent required, in closed boilers, without any deposition of salt therein.

In the manufacture of common salt from rock salt, a heated solution of chloride of calcium, or chloride of magnesium is employed, for the purpose of dissolving the salt from the rock salt, and thereby producing a solution, from which common salt is obtained by cooling.

The coolers or crystallizing vessels, are in each case furnished with partitions, by which means salt of various degrees of fineness may be produced, the finest salt being deposited in the division nearest to the closed boiler, where the solution will be the hottest, whilst the coolest or farthest division will produce salt of the coarsest quality. The chlorides of calcium and magnesium used, remain in the mother-liquors, and may therefore be collected and used again and again.

The chief advantage, therefore, derivable from the adoption of these processes by the manufacturer of common salt, appears to be, that of enabling him to concentrate his brine to the strength required for the production of salt of the crystalline character he requires; the deposition of salt in the boilers (which takes place during the process of concentration under ordinary circumstances), being prevented by the addition of suitable proportions of the chlorides of calcium and magnesium.

We have no data before us, as to the extent to which these processes have been commercially applied, either in this country or in France.

IMPROVEMENTS IN THE MANUFACTURE OF ALUM.

THE Boghead Cannel coal, which, on account of the large quantity of gas yielded by its distillation, has lately been introduced from Scotland, for the purpose of gas making in the dark and foggy days of the winter season, contains a large quantity of alumina, and a patent has recently been specified by Messrs. Barlow and Gore, for a method of treating the residuum of the distillation of this coal, and manufacturing alum therefrom. The residuary ash, whether resulting from the combustion of the coke, or from its treatment by steam, as adopted by the patentees for obtaining certain gases, is placed in suitable vessels or boilers, and subjected to the action of heated dilute sulphuric acid; the result of which is, the solution of the alumina contained in the ash, and the formation of sulphate of alumina. The solution of aluminous sulphate thus obtained, may be evaporated so as to yield that salt, or it may be mixed with the proper quantity of either sulphate of potash or sulphate of ammonia in solution, whereby the ordinary commercial alum is obtained by evaporation and crystallization in the usual way. The residuary silica is applicable to the manufacture of glass and other useful purposes in the arts.

The Cannel coal above mentioned is raised at Boghead, near Bathgate, a few miles westward of Edinburgh. It is the most highly bituminous coal known, and therefore peculiarly adapted for the manufacture of gas, for which purpose it is exclusively used, either alone or in conjunction with inferior coal. It yields 13,500 cubic feet of gas, of the specific gravity 0.775 (air being 1.0) per ton of coal; and a burner consuming at the rate of one cubic foot per hour, gives a light equal to $8\frac{1}{2}$ spermaceti candles, each consuming 120 grains of spermaceti per hour. The light yielded by one ton of this coal is equal to 1,990 lbs. of sperm candles, being nearly five times more than that from the same quantity of Newcastle coking coal, and upwards of two and a half times greater than the best Wigan Cannel coal.

ON THE PREPARATION OF AN OIL INTENDED TO REPLACE COD-LIVER OIL.

BY M. DESCHAMPS.

THE action of cod-liver oil in certain affections being generally attributed to the iodine which this oil contains, I have thought that it might be advantageously replaced by an ioduretted oil, the preparation, adjustment of strength, and administration of which, offer no difficulties, provided that the aromatic principle of the cod-liver oil does not contribute to its good effects, or represent the principle which tends to restore, in certain cases, the equilibrium of the vital functions.

In presenting to the Academy a medicine intended to replace a preparation which is in general use, without previously confirming my anticipations of its efficacy by experiment, I act under the impression that it is the province of the pharmacist to prepare medicinal agents, and to leave the study of their therapeutic properties to the physician. I am also persuaded, that if the proposed remedy is prepared by pharmacists generally, and extensively tried by medical men, its virtues will be more promptly discovered; for I feel assured that it is a valuable agent, containing, as it does, the iodine in quantities which may be regulated at pleasure, and in the state most suitable for its assimilation.

1. When oil of almonds* is left in contact with one-tenth of its weight of iodine at common temperatures, shaking them together frequently, the iodine dissolves in the oil, giving to it a red colour, which assumes a deeper shade until it becomes black.

* Olive oil is more easily altered under the influence of iodine than oil of almonds.

2. If the above mixture be made, with the addition of ten per cent. of water, the oil first acquires a red colour, but after a long time it becomes colourless.

3. If alcohol be used, the reaction is more rapid. Thus, on adding an alcoholic solution of iodine gradually, 100 grammes of oil of almonds may be made to decolorize twelve grammes of the solution, representing one gramme of iodine, in eighteen days.

If these mixtures be heated, the reaction is much more rapid, a few hours only being required for its completion.

4. When ten grammes of iodine, and 100 grammes of oil of almonds, are heated in a water-bath, the oil quickly becomes black.

5. If one part of iodine, and four parts of oil be used, the oil becomes greatly altered.

6. If one part of iodine and two parts of oil be employed, the oil will be still more greatly altered, losing its fluidity, and acquiring a granular appearance.

7. On submitting to distillation a mixture of 100 grammes of oil of almonds, and 24 grammes of tincture of iodine, representing two grammes of iodine, the first drops of alcohol which pass in distillation will be but little coloured, and the oil will be colourless, if a piece of platinum foil be kept in the retort. If the platinum be omitted the oil will remain coloured, and this will be the case, even if bits of stone be substituted for it.

From these preliminary considerations, it will be readily perceived that a medicinal ioduretted oil may be prepared by the action of tincture of iodine on oil of almonds, either in the cold or with heat, or especially by heating a mixture of iodine and oil of almonds in a water-bath.

Preparation of a colourless ioduretted oil.

Take of Oil of almonds, 100 grammes (3iij 3j 43 grs.)†

Tincture of iodine, 24 grammes (370 grains)

containing 2 grammes of iodine (30.8 grains)

Put this mixture into a retort‡, introduce a piece of coiled platinum foil, and carefully distil until the oil has become perfectly colourless. Remove the oil from the retort, wash it with distilled water containing two parts of bicarbonate of soda to 1000 parts of water, and afterwards with pure water, to remove any excess of alkali§. Filter it into a bottle, add two grammes (30.8 grains) of starch, shake them together, heat the mixture by means of a water-bath for an hour, allow it to cool, filter it, and keep it in bottles.

This oil will keep for a long time, if it be not exposed to the contact of air.

One gramme of this oil represents 0.0052 gramme of iodine, and twelve grammes (185 grains) of it contains as much iodine as one litre (f. 3 35) of cod-liver oil.

Preparation of a coloured ioduretted oil.

Take of Oil of almonds, 100 grammes (3iij 3j 43 grs.)

Iodine, 10 grammes (154 grains).

Put them into a flask or a bottle, heat them by means of a water-bath for some hours, shaking them together from time to time that the iodine may not act too powerfully on one part of the oil; allow the mixture to cool; wash it with alcohol and remove any iodine which has not combined with or dissolved in the oil; wash it with alkaline water, then with pure water, and finally filter it.

One gramme of this oil represents 0.081 gramme of iodine, and two grammes (30.8 grains) of it contains more iodine than one litre (f. 3 35) of cod-liver oil.

The chemical phenomena which occur in these operations are very remarkable, for it may be observed that, under the influence of the platinum, two parts of iodine combine with one hundred parts of oil of almonds without imparting colour to it, and that during this reaction the platinum is not altered by the iodine, either in its aspect or weight, even after many operations. It is also observed, that when the oil and iodine are heated together without the platinum, the iodine does not volatilize, but the oil becomes black, and acquires the smell of iodine and of burnt oil; that a small quantity of water condenses in the neck of the flask; that the oil becomes acid; that on washing it with water it yields hydriodic acid; that alcohol removes

† I have never operated on more than 400 grammes of oil.

‡ A flask may be used, but in this case it ought not to be more than half full.

§ Sometimes the oil assumes the character of an emulsion in this process. In such case, boil some water in a tinned vessel, pour the oil on it, boil for a short time, and then decant.

the iodine which has not combined; that it dissolves at the same time an ioduretted aromatic principle and a certain quantity of oil; that on adding ether to the oil which has been treated with half its weight of iodine (as in experiment 6), it dissolves all the oily matter, and leaves a black elastic matter, which probably represents the oxide of lypil of the oil; that when the alcohol which has been used for washing ioduretted oil is distilled, it has the smell of horseradish; that this alcohol, sooner or later, acquires a yellow colour; that potash decolourizes it; that the odourous principle may be concentrated into a small volume; that the alcohol retains, even after several distillations from potash, a portion of iodine; that when attempts are made to resolve the ioduretted oil into glycerine and oleric and margaric acids, glycerine and ioduretted acids are obtained; that the glycerine has an acid reaction; that the quantity of glycerine obtained will depend upon the quantity of iodine added to the oil; that the oil made according to experiment 5, yields very little glycerine; and that the oil made according to experiment 6, yields none, because during the action of the iodine on the oil, the oxide of lypil is so far modified as to lose the property of giving rise to the formation of glycerine when the oil is treated with oxide of lead and water.

In order to verify this hypothesis, I made a mixture of one part of iodine and two parts of oleic acid, and of one part of iodine and two parts of glycerine. These mixtures were heated in a water-bath for several hours, and I found that the oleic acid combined with the iodine, became much thickened, and remained perfectly soluble; that the glycerine dissolved a little iodine, and was not altered at this temperature; that the action of the iodine upon the oleic acid indicates that the black matter obtained in experiment 6, is not due to an alteration of the oleic acid; and that the action of the iodine on the glycerine does not sustain the hypothesis which I have proposed to account for the alteration of the oil, as it is not modified under these circumstances; but the difference which exists between the composition of glycerine and that of oxide of lypil, is sufficient to enable us to conceive that while the glycerine in the isolated state is not altered by iodine, the oxide of lypil may be, and that the inalterability of the isolated glycerine does not prove that oxide of lypil cannot be altered.

Notwithstanding this, it was thought necessary definitively to determine this question—to isolate the different products, to analyze them, and to compare their compositions with similar products isolated from non-ioduretted oil. But, unfortunately, I have not yet been able, after two years, during which I have been engaged with the investigation, to isolate and purify those products, so as to feel satisfied that they were unmixed and definite, and I therefore determined to publish the results of the first part of my investigation, fearing that the remainder would yet occupy some time.

The conclusions which may be deduced from the facts briefly stated in this communication are:

That ioduretted oils, properly washed, may be considered as valuable medicines, by means of which medical men may safely administer iodine.

That by mixing a given quantity of ioduretted oil with olive oil, an oil may be prepared analogous to cod-liver oil, or if desired, more active.

That in prescribing ioduretted oil, the medical man would know the exact quantity of iodine administered.—*Repertoire de Pharmacie.*

EXAMINATION OF AN ORE OF CINNABAR, FROM NEW ALMADEN, CALIFORNIA.

BY ADAM BEALEY, ESQ., M.A.

THIS ore has long been known to mineralogists as abundant and very accessible, but it had not attracted much notice until the recent development of the mineral wealth of California led to more extended inquiry into the actual extent of its distribution, and rendered improved methods of reducing it of great interest and value.

The mine, or principal deposit of this mineral, is thus described by Lyman in 1848 :*

"New Almaden lies between San Francisco and Monterey, near the Coast. It is 1200 feet above the plain, and is situated upon a ridge of the Sierra Azul, which consists of a greenish talc-rock.

"The cinnabar is found in nests, in a stratum of a yellowish earth, which is 42

* Liebig and Kopp's *Annual Report*, by Hofmann and De La Rue. Vol. II., p. 388.

feet in thickness. The occurrence of this mineral has been known to the natives from time immemorial, as the cave of red earth, which they employed for painting their bodies.

"During Lyman's stay, the daily produce from 1,600 lbs. of cinnabar, distilled in a rudely constructed apparatus, was from 200 to 300 lbs. of mercury, and in the last three weeks of his residence the total amount of mercury obtained was about 10,000 lbs.

"Cinnabar had likewise been found in fifteen or twenty other places, within a circumference of a few miles."

A more recent account of this mine was politely communicated by Dr. Forbes, and accompanied a specimen of the ore sent to Professor Hofmann for analysis, at whose suggestion the following examination was undertaken :—

"The mine of New Almaden is situated in Upper California, near Santa Clara, on the coast, not far from San Francisco. It is the property of a company of English and foreign merchants, and is leased to a company of the same kind.

"It has been in active operation for about six or eight months. The vein is very large, and 'crops out' on the surface, where it is worked. The metal is extracted from the ore in two ways :

"First, by a series of large iron cylinder-retorts, heated in furnaces, and discharging their produce into water, where the metal is condensed.

"Secondly, by brick furnaces, in which the fuel (wood) is intermixed with the ore. By these operations, the ore gives from 30 to 45 per cent. of its weight of mercury.

"The mine produced in the month of November, 1850, not less than 127,500 lbs. of mercury."

The ore as exhibited in the specimens sent, some of which weighed as much as 14 avoirdupois lbs., has a bright red colour, slightly inclining to purple, and appears to have been imperfectly cleared from a soft, light-brown earth, which can easily be scraped from its surface. It breaks without much difficulty under the hammer, and is afterwards easily reduced to powder, with the exception of some bright crystalline particles, which are extremely hard.

The surfaces of recently broken ore appear much more purple than those long exposed. It is traversed at irregular intervals by very thin bands of white, hard, crystalline material, apparently calcareous and siliceous. When in the state of fine powder it has a very brilliant vermilion colour, many shades darker than the massive ore. Its sp. gr. is 4.410.

In a preliminary examination, it exhibited the ordinary phenomena of a mercurial sulphide associated with siliceous matter. A portion of the ore was digested with nitro-hydrochloric acid, and the insoluble residue separated by filtration.

The solution examined by the usual methods contained mercury, sulphur, iron, alumina, a trace of nickel, lime, and magnesia.

The part insoluble in acid consisted of silicic acid, and very minute traces of lime and potassa.

In estimating the principal constituents of this ore, the mercury was determined as sulphide of mercury, and as metallic mercury by distillation with lime.

1. 2.238 grms. gave 1.801 grm. of sulphide of mercury.
2. 1.037 " " 0.860 " "
3. 250 grms. distilled with 500 grms. of lime, gave 175.540 grms. of metallic mercury.

The sulphur was estimated as sulphuric acid.

1. 1.349 grm. gave 1.120 grm. of sulphate of baryta.
2. 1.248 " " 1.025 " "

Iron as sesquioxide.

1. 1.940 grm. gave 0.024 grm. of sesquioxide of iron.
2. 1.610 " " 0.022 " "

Lime as carbonate of lime.

1.940 grm. gave 0.0485 grm. of carbonate of lime.

Alumina.

1.940 grm. gave 0.012 grm. of sesquioxide of aluminium.

Magnesia as pyrophosphate of magnesia.

1.940 grm. gave 0.0525 grm. of pyrophosphate of magnesia.

Insoluble residue.

1. 1.349 grm. of ore gave 0.193 grm. silicic acid.
2. 2.238 " " " 0.325 grm. of silicic acid. and traces of lime and potassa too slight to be estimated.

The percentages corresponding to these numbers will be found in the table appended at the end of this note.

CINNABAR FROM ALMADEN, SPAIN.

As the appearance of an ore of cinnabar, so rich in mercury and found in such profuse abundance, seems likely to have a material influence upon the permanent supply ordinarily found in commerce, a comparison was instituted between this and the ore derived from Almaden, in Spain, well known as the chief source of Spanish mercury.

The specimen of ore examined was obtained from Mr. Tennant, and described as one from which a considerable part of Spanish mercury was derived. It is like the Californian ore, massive, but much less brilliant and much harder. Throughout its mass, small patches of yellow iron pyrites are irregularly distributed. When in the state of fine powder, it has a dull brick-red colour, in striking contrast with the brilliant vermillion cinnabar from California. Its sp. gr. is 3.622.

- Submitted to the same examination, and treated similarly to the last, it exhibited the same phenomena, with variations too slight to require especial notice.

The part soluble in acid consisted chiefly of mercury, sulphur, iron, with traces of alumina and lime; the part insoluble in acid, of silicic acid and alumina.

The principal constituents of the mineral were determined as before: mercury, as sulphide of mercury; iron, as sesquioxide of iron; sulphur as sulphuric acid; silicic acid as such.

Mercury.

1. 1.009 grm. of ore gave 0.443 grm. of sulphide of mercury.
2. 1.0205 " " " 0.447 " "

Sulphur as sulphuric acid.

- 1.0205 grm. of ore gave 1.208 grm. of sulphate of baryta.

Iron.

- 1.009 grm. gave 0.148 grm. of sesquioxide of iron.

Insoluble residue.

1. 1.0205 grm. gave 0.357 grm. of silicic acid and alumina.
2. 1.009 " " " 0.353 " "

I have moreover examined specimens of cinnabar ore from Moschellandsberg and from Wolfstein.

CINNABAR FROM MOSCHELLANDSBERG.

This specimen and the following one were obtained from Mr. Griffin, and described as being worked, though of comparatively rare occurrence.

The mineral is a dark, red-brown crystalline material, heavy, very hard, and with difficulty reduced to powder. Its sp. gr. is 4.735.

Examined and treated as the minerals previously mentioned, it was found to consist principally of mercury, sulphur, iron, alumina, and silicic acid. Mercury and sulphur only were determined quantitatively.

Mercury.

1. 1.166 grm. of ore gave 0.902 grm. of sulphide of mercury.
2. 1.255 " " " 0.967 " "

Sulphur as sulphuric acid.

- 1.3075 grm. gave 1.050 grm of sulphate of baryta.

Insoluble residue.

- 1.3075 grm. gave 0.2235 grm.

CINNABAR FROM WOLFSTEIN.

This ore is a grey, earthy-looking mineral, with dark livid patches occurring at intervals in its substance. It is very hard, and becomes a light puce-coloured powder. It was found to consist of mercury, sulphur, alumina, and a trace of iron, and silicic acid.

- 1.516 grm. yielded 0.316 grm. of sulphide of mercury.

From the above results, the following percentages were calculated :—

COMPOSITION OF VARIOUS CINNABAR ORES.

	Californian.				Almaden, Spain.				Moschellandsberg.				Wolfstein.
	1.	2.	3.	Mean.	1.	2.	Mean.		1.	2.	Mean.		
Mercury ...	69.36	70.13	70.23	69.90	37.84	37.75	37.79		66.60	67.13	66.86		18.00
Sulphur ...	11.38	11.21	—	11.29	16.23	—	16.22		11.01	—	11.43		
Iron	1.23	—	—	1.23	10.36	—	10.36		Insol.	—	—		
Lime	1.40	—	—	1.40	—	—	—		residue 17.09	—	17.09		73.51
Alumina ...	0.61	—	—	0.61	—	—	—						
Magnesia ...	0.49	—	—	0.49	—	—	—						
Silicic acid	14.30	14.52	—	14.41	Silicic acid and alumina.....		35.12						
				99.33			99.49						

From these numbers it is evident that, provided the specimens represent the average minerals worked, the ore of California contains nearly double the amount of mercury found in the Almaden ore, and nearly fourfold that of the specimen of Wolfstein, while it approaches the composition of pure cinnabar, even more nearly than the mineral of Moschellandsberg.

PREPARATION OF NITRATE OF POTASH FROM NITRATE OF SODA.

NITRATE of potash can be prepared from nitrate of soda by placing two vessels, of which the upper one contains nitrate of soda, and the lower the same quantity of carbonate of potash, over one another, and as soon as both solutions boil, the fire under the upper vessel is extinguished and the liquid allowed to flow into the lower one, when immediately hydrated carbonate of soda is precipitated, and the residual lye is allowed to flow into crystallizing pans, and agitated, in order to obtain salpêtre-meal [salpêtre-mehl], which is to be treated in the usual way.—*Pharm. Central Blatt*, No. 37, p. 592, 1851.

ON THE PALO DE VELAS OR CANDLE-TREE.

(*Parmentiera cereifera*, Seem.)

BY M. BERTHOLD SEEMANN.

THIS tree is confined to the valley of the Chagres, where it forms entire forests. In entering them, a person might almost fancy himself transported into a chandler's shop. From all the stems and lower branches hang long cylindrical fruits, of a yellow wax-colour, so much resembling a candle as to have given rise to the popular appellation. The fruit is generally from two to three, but not unfrequently four feet long, and an inch in diameter. The tree itself is about twenty-four feet high, with opposite, trifoliolated leaves and large white blossoms, which appear throughout the year, but are in greatest abundance during the rainy season. The *Palo de velas* belongs to the natural order *Crescentiaceæ*, and is a *Parmentiera*, of which genus, hitherto, only one species, the *P. edulis*, De Cand., was known to exist. The fruit of the latter, called *Quauhxilot*, is eaten by the Mexicans; while that of the former serves for food to numerous herds of cattle. Bullocks, especially, if fed with the fruit of this tree, Guinea grass, and *Batatilla* (*Ipomœa brachypoda*, Benth.), soon get fat. It is generally admitted, however, that the meat partakes in some degree of the peculiar apple-like smell of the fruit; but this is by no means disagreeable, and easily prevented if, for a few days previous to the killing of the animal, the food is changed. The tree produces its principal harvest during the dry season, when all the herbaceous vegetation is burned up; and on that account its cultivation in tropical countries is especially to be recommended: a few acres of it would effectually prevent that want of fodder, which is always most severely felt after the periodical rains have ceased.—*Hooker's Journal of Botany*.

DR. MUSPRATT'S ANALYSIS OF THE WATERS OF BADEN-BADEN.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—In Dr. S. Muspratt's paper "On the Waters of Baden-Baden," the learned professor says the qualitative analysis proved the sulphuric acid was not in combination with lime. Surely he does not intend to assert that a mineral water containing six grains of sulphate of lime in the gallon would yield on ebullition a precipitate of sulphate of lime! and I see no account of any other test having been applied to demonstrate that the sulphuric acid was not contained in the water as sulphate of lime.

I am, Sir, yours truly,

Bristol October 9, 1851.

JAMES GRANT.

GODFREY'S CORDIAL.

We publish the following extract of a letter from Mr. P. D. Ward, of 22, Market Place, Hull:—

"Allow me to introduce to notice, through the medium of your periodical, an existing evil of no small magnitude, and which, while it admits of an easy remedy, is attended with incredible danger to the life of England's little ones. I refer to the great variety of strength in the private formulæ for the medicament called 'Godfrey's Cordial,' which article, though perhaps not extensively used in the metropolis, is, nevertheless, largely consumed in our provincial towns, a gentleman of my acquaintance having had a sale for as much as half a cwt. per month.

"In two formulæ which I saw casually brought together the other day, there was a difference in strength of eight times, one containing half a grain of opium in the fluid ounce, and the other four grains. Now if a child accustomed to take Godfrey's Cordial of the first quoted strength were to have substituted in lieu of it some of the other, through the circumstance of the purchaser's having gone to a different shop, it is evident that the consequences would be disastrous."

[Our correspondent concludes by recommending the insertion of a formula for this medicine in the Pharmacopœia, a recommendation in which we cannot concur, as it is an established fact that opium in any form is highly injurious to young children.—Ed.]

POISONING BY TINCTURE OF ACONITE.

On Monday, the 6th of October, an inquest was held by Mr. Carter, coroner for East Surrey, on the body of Mr. F. R. Bolton, an excise officer, who died in consequence of tasting some tincture of aconite. A case of "medicated spirits" had been received at St. Katherine's Wharf with a permit from Scotland. The guager (Wm. Bennett) took out a bottle for examination, and without removing the wrapper, poured some of the contents into a glass, "put a wooden penholder into the liquid, and then drew it across his lips." Mr. Bolton (the deceased) having tasted it, the bottle was handed to Mr. Brain, the principal officer, who immediately tore off the wrapper, and found it was labelled, in large letters, "Fleming's Tincture of Aconite—Poison." Bennett, at the inquest, stated that he had a burning sensation in his throat all that evening. Deceased did not complain at the time, but left the office soon afterwards. In the course of the evening he was taken to Mr. R. T. Russell, surgeon, in a state of exhaustion, perfectly sensible but cold and pulseless. He mentioned the circumstance of his tasting the tincture of aconite, and said he thought he had swallowed about a teaspoonful. The remedies applied were ineffectual, and he shortly expired. Mr. Russell thought the wrapper ought to have been labelled outside, in which opinion the coroner concurred. The jury returned the verdict "That the deceased met his death accidentally, and they (the jury) would suggest to the Commissioners of Inland Revenue, that when any article of poisonous character is imported, the permit should bear the word **POISON**, as well as the nature of the article itself."

LIBEL UPON CHEMISTS AND DRUGGISTS.

At the Middlesex Sessions (Oct. 15) a person named Stimpson, a vendor of surgical bandages, was prosecuted for the sale of indecent and obscene prints. The offence was proved and admitted.

Mr. Sleight (on the part of the prosecutors) said, "It appeared that the defendant had been in the habit of selling cards and prints of this description at Chemists and Druggists shops, and the Society for the Suppression of Vice had received information that at such shops articles of that description were now to be obtained, so many of the parties who kept shops exclusively for the sale of such things having been prosecuted and visited with the severity of the law. It was from a Chemist of highly respectable character that the Society derived the information which led to the apprehension of the defendant, and it was very desirable that it should be known that the Society knew it, in order that those Chemists who engaged in the traffic might be aware of the consequences that would in all probability follow.

"The Learned Judge said, Chemist's shops were the places where poisons were sold; but it appeared that they were selling poisons for the mind as well as the body. The sentence upon the defendant was that he be imprisoned and kept to hard labour for six calendar months."

[We do not believe that any foundation exists for this calumny against Chemists and Druggists. It is not impossible that some persons, availing themselves of the present defective state of the law, have assumed the name and the coloured show-bottles as a blind for the purpose of evading detection. But the sweeping charge against Chemists and Druggists is an injustice to which that body will always be subject until an Act of Parliament has been passed for the registration of those who are fairly entitled to assume the name.—ED.]

 REVIEW.

TRANSLATION OF THE PHARMACOPŒIA OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON, 1851; with *Notes and Illustrations*. By RICHARD PHILLIPS, F.R.S., &c. Highley and Son, Fleet Street.

THE name of Richard Phillips has become so intimately connected with the London Pharmacopœia, from his having first successfully exposed the defects which some years ago existed in many of the processes adopted by the College, and from his having been known to have originated most of the improvements which have been effected in the last two editions of the work, that the notes and illustrations which have accompanied his translation have long been looked upon as almost equal in authority with the instructions contained in the formulæ themselves. His translation of the Pharmacopœia of 1836 has deservedly had a most extensive circulation, having, at the time of the lamented death of the author, almost entirely superseded all other works of the sort. The new Pharmacopœia, which appeared a few months ago, seemed to be incomplete without the explanations and comments of the man the results of whose chemical and pharmaceutical experience it so largely represented, and the work before us was, therefore, anxiously looked for to complete the exposition of the amended code of pharmaceutical formulæ. The death of Mr. Phillips, which occurred in last May, gave rise to some doubt whether this work would be published, but it appears from the preface that it was then partly in the press, and the widow and executrix placed the copious manuscript and explanatory notes which were left, in the hands of Mr. J. Denham Smith, a former pupil of the author's, by whom the completion of the work has been accomplished.

The editor states, "I have deemed it my duty, so far as I was able, strictly to carry out the author's design of making the present work a compendium of whatever is yet known respecting the more important chemical properties of every substance and preparation inserted in the Pharmacopœia, and therefore whenever an article of the *Materia Medica* is used in a preparation, its chemical and physical history is given, either under the first or the most important preparation in which it occurs." He further states, "I have freely availed myself in this work of the views and results of Chemists, and of the labours of various writers on *Materia Medica* and Pharmacy, and have adopted whatever information I have met with of a reliable and suitable kind, frequently without specific acknowledgment of its source, as will be evident to all who are versed in these departments of science."

The editor seems to have devoted much labour to the task he had undertaken; at least we may conclude so, if the augmentation in the size and contents of the volume as compared with those of its predecessor is to be ascribed to this cause. The extent of the book has been increased by about 100 pages, and as the additional matter causing this augmentation of size is in small type, the amount of matter added is considerable. It is not unnatural that a young editor should indicate in this way the zeal with which he entered upon his task. But the high character which Phillips's *Translation of the Pharmacopœia* has acquired, may be ascribed, not so much to the copiousness of the notes as to their being generally correct, and embodying the results of the long practical experience and scientific study of the author as a Chemist and Pharmaceutist. Mr. Phillips's remarks on the preparations of the *Pharmacopœia* will continue to be referred to by Pharmaceutists and others for many years to come.

We regret that the editor of the work before us has not indicated that portion of the matter for the introduction of which he alone is responsible, for in the absence of this, there will necessarily be less confidence felt in the remarks which are appended to the formulæ than might otherwise have been the case. There are certain indications throughout the work that two minds have been engaged in its production, for here and there we find indications of a want of that practical knowledge which Mr. Phillips so eminently possessed; there is also some inconsistency between different parts of the work. As an example of the former defect we may refer to the article on Chloroform. In translating the directions of the College for preparing this body, the sentence "*Distillet liquor in receptaculum eo usque ut nihil sit quod sidat,*" is rendered "*the liquid may distil into the receiver so long as nothing separates from it.*" Now, any one who had ever performed the process, would know that the direction as given in English is wholly inapplicable, the chloroform separating from the aqueous liquor with which it distils over so long as any of the former is produced, and the continuance of the distillation being useless when such separation ceases to take place. This error, which has no doubt arisen from want of a practical acquaintance with the phenomena described, has been committed in other translations which have appeared. *Eo usque* should have been translated *until*, instead of *so long as*. We might also refer to the articles on the distilled waters, liniment of verdigris, and ammonio-citrate of iron, for similar indications either of a positive or negative character. Again, in the remarks appended to the formula for acetum cantharidis, it is stated that this preparation produces a blister in five or ten minutes, whereas, under the head of emplastrum cantharidis, we are told that strong acetic acid precipitates cantharidin from its solution in alkalis, "which reaction renders the use of cantharides in acetum cantharidis somewhat problematical." The remarks on prepared Burgundy pitch, and prepared frankincense, show that the writer was not correctly informed on these subjects, and moreover, they are inconsistent with what is stated in the *Materia Medica* part of the work.

Having thus referred to what we conceive to be defects in the execution of the work, we may mention the method adopted of representing chemical decompositions as a decided improvement upon that which had been previously used by Mr. Phillips. The diagrams, now for the first time introduced into this work, have long been employed by Chemists, and have been found greatly to facilitate the explanation of results when the nature of the reactions are understood.

MANUAL OF HUMAN PHYSIOLOGY FOR STUDENTS ; being a Condensation of the Subject, a Conservation of the Matter, and a Record of Facts and Principles up to the Present Day. To each subject are appended, in Notes, Summaries in Rhyme, of the Composition of the Fluids and Solids, &c. By JOHN MORFORD COTTLE, Licentiate of the Royal College of Physicians, London, &c. London : Highley and Son, Fleet Street, 1851. 8vo, pp. 803.

A PRACTICAL ANALYSIS OF SEVENTY CASES OF INFLAMMATORY, FUNCTIONAL, AND STRUCTURAL DISEASE OF THE HEART ; with Observations on the Treatment and Prevention. By S. SCOTT ALISON, M.D., Licentiate of the Royal College of Physicians, London. London : John Churchill, Princes Street, Soho, 1851. Pp. 45.

DESCRIPTION OF NEW PREPARATIONS OF GOLD FOR STOPPING CARIOUS TEETH, and of the Manner of Using them. By JOHN TOMES, F.R.S., Surgeon-Dentist to the Middlesex Hospital. London : Printed by Wilson and Ogilvy, 57, Skinner Street, Snowhill, 1851. Pp. 11.

TO CORRESPONDENTS.

B. B. (omitted last month)—(1.) Concentrated compound decoction of aloes. See vol. vi., pp. 221 and 295.—(2.) A good kind of displacement apparatus is sold by Mr. Ayliff, 187, Tottenham Court Road, price from 12s. to 30s., according to size.—(3.) Amalgams of mercury and copper. To a hot solution of sulphate of copper add a little muriatic acid and a few sticks of zinc; boil the mixture for about a minute. By this means the copper will be precipitated in a finely-divided spongy form. Take out the zinc, pour off the liquor, wash the copper with hot water, and pour upon it a little dilute nitrate of mercury. Then add mercury to the amount of twice or three times the weight of the copper, and a slight trituration will combine them so far that the completion of the process may be effected by heating the mixture for a few minutes in a crucible.—*Aikin*.

J. B. and H. H.—Sulphur is enumerated among the sixty-two chemical elements.

Mr. T. B. Clark will observe we have noticed the subject to which he refers.

Enquirer (Great Yarmouth).—We have answered the question so often that we cannot give up space to repeat it. We should have replied by post if the address had been given.

A. H. (Beaminstor).—The statement is quite correct; but we think we have already said enough on the subject.

W. D. D. (Kidderminster).—We are not acquainted with any published work on the manufacture and colouring of scented soaps. Each manufacturer has his own private receipt book.

An Apprentice (Manchester)—*Parnell's Chemical Analysts*.

H. H. I.—The drawback on manufactured spirits depends on the strength of the spirit.

The London Temperance League.—The invitation was received the day after the lecture.

An Assistant (London).—*The Pharmaceutical Latin Grammar*, by Cooley (Groombridge, Paternoster Row); *Selecta & Prescriptis* (Lengmans,) See Vol. viii., No. 8. (The Examinations.)

X. (Settle).—*C. M. G. (Dundee)*.—See the above.

J. J.—*Nitroprusside of Sodium* is prepared as follows: One equivalent of yellow prussiate of potash in powder is digested in five equivalents of commercial nitric acid, diluted with an equal bulk of water, until the solution precipitates salts of protoxide of iron of a slatey colour. It is then neutralized with carbonate of soda, and the liquor boiled until a green precipitate subsides; this is separated by filtration, and the liquor evaporated until nitrates of potash and soda crystallize out. The liquor now contains the nitroprusside of sodium, which may be crystallized by further evaporation.

G. (Helston).—Sulphite of soda differs from the sulphate in containing one atom less of oxygen. We are not aware of its being used in medicine.

E. R. S.—See Vol. iv., pp. 82 and 194.

Marant.—The proposed Pharmaceutical Bill would not affect those now in business.

COMPULSORY ATTENDANCE AT LECTURES.—A correspondent, whose letter is dated London, Oct. 8th, has been deceived by certain mis-statements which have been in circulation on this subject. It is not and never was the intention of the Council to enforce the attendance of students at any particular school. On the contrary, the principles adopted by the Society have differed from those of the medical bodies in this respect, that no attendance at any school is requisite, the student being at liberty to obtain his education when, how, and where he thinks proper. A compulsory examination would have a tendency to induce young men to attend lectures by making qualification necessary. Every school would find its level, as students would for their own interest go to the best source within their reach for obtaining the requisite qualification.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho.

Other Communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. VI.—DECEMBER 1st, 1851.

THE LAST INVENTION IN HOMŒOPATHY.

To Mr. Rutter, of the Black Rock, Brighton, belongs the credit of inventing an instrument, called The New Magnetic Indicator, or Magnetoscope, which has created great excitement in homœopathic circles. It has been stated of this instrument that "besides its vast importance to the science of magnetism in all its forms, it holds out the means of demonstrating the fact that the homœopathic medicines do act on the human organism. This is a discovery which would have gladdened the heart of Hahnemann, had he been in the life of the body. This instrument which affords the means of proof of a fact the opponents of homœopathy have always rejected without inquiry, has been discovered at a most opportune time."

By what process of induction Mr. Rutter arrived at the result we are not informed. However this may be, the possession of a means of demonstrating "the action of homœopathic medicines on the human organism" is a novelty, for which the discoverer may claim a debt of gratitude from the homœopaths. We are told that the great "fact" has "always been rejected by the opponents of homœopathy without inquiry." It has certainly been rejected without proof on either side—and why? Because the infinitesimal atoms are invisible, and inappreciable by any of the senses, affording no tangible clue by which their properties could be traced.

This *hiatus* in the chain of evidence is now occupied by Mr. Rutter's instrument, which consists of an upright post fixed to the table, to the top of which is attached a horizontal brass rod, terminating with a pair of forceps grasping a piece of silk, by which is suspended a small pendulum of sealing-wax. Under the pendulum is a dial-plate graduated and lettered A B C to H. The operator places his finger, or finger and thumb, on the top of the perpendicular post, using his other hand in performing the various experiments, and at the same time watching the oscillations of the pendulum. When the pendulum wags, the dial-plate unfolds the tale, and the operator, by reference to his A B C, proclaims to the astonished patient the action of the homœopathic remedies, besides a variety of other facts of a highly interesting and exciting character.

If we were to give a report of these experiments in our own words we might be suspected of shooting with a long bow, or taking a leaf out of the book of Baron Munchausen. We therefore quote a few passages from a lecture by Dr. Quin, which will serve to impress our readers with an idea of the marvellous nature of the discovery, and the magic performances of the "Magnetoscope."

In case the reader should be induced to suspect that the account is at all exaggerated, the following paragraph by Dr. Quin, bearing testimony to the accuracy of Mr. Rutter and his instrument, will set that question at rest.

"Mr. Rutter, who is a man, as you may suppose, of great scientific knowledge, leaves no loophole for scepticism, the beautiful series of experiments made by him all tending to corroborate and affirm one another. The instrument is so subtle, and the demonstration so clear, whilst the experiments are at the same time so delicate and exact, the same cause often repeated invariably producing the same effect, that no one can resist the positive evidence of the undeviating action of this scientific and truly philosophical instrument."

The sagacity of the instrument, in discriminating between the "male and female influence," and a pathetic little episode of "the lady and the dead fly," are beautifully described by Dr. Quin.

"If a person of the female sex puts the index or forefinger on the operator's hand, the pendulum, instead of moving as when the index of a male is in contact with the hand, from D to C, moves from B to A. When the female thumb touches the hand of the operator instead of moving from B to A, as in the case of the male thumb, the pendulum immediately moves from D to C: and when the whole hand of the female is placed on the hand of the operator, the movement becomes circulatory in the

direction of from B round to G, that is from right to left, the exact reverse of the normal action.

"The next experiment was one of great interest, and exemplified in a beautiful and indisputable manner the experiment to which I alluded in a former part of the evening, viz., the instrument being stopped by the operator when put in contact with dead animal matter. After having put the instrument in full normal action by applying the finger and thumb of the right hand, a *dead fly* being put on his left hand, the motion of the pendulum immediately ceased; on the fly being removed the motion recommenced. A chain of men, holding one another by the hand, was formed; a female placed her hand on that of the man most remote from the operator; the motion of the instrument was immediately reversed, the circulatory motion being from right to left. A dead fly was then put upon the left hand of the female, and the motion immediately stopped.

"A wire of copper 500 feet long, encased in gutta-percha, was then added to the chain of men; the one furthest from the operator held one end of the wire, and the female the other end; the female influence was immediately sent through both the wire and the chain of men, and a corresponding action was again set up, which was again stopped immediately by the dead fly being put upon the other hand. Similar experiments were made with other dead matter, even merely by holding the hand over or near the dead matter, the *aura* of which equally stopped the motion.

"If a person of the female sex merely breathes upon the hand of the operator, it immediately changes the current to the female; if a man breathes upon her hand, the other hand being in contact with the operator, the male influence is immediately perceived on the pendulum. If a hair of a female is placed on the hand of the operator, or on the hand of the last of any number of men in contact with him, the female current is immediately produced. The same phenomenon is immediately produced by a pocket-handkerchief worn by a lady.

"If one hand of the operator is put to the back of the head of a person standing near him, the current is normal, but if put to the forehead, the motion immediately ceases, proving the south and north poles to be the back and fore part of the head. If the hand is then put on the right shoulder, the action is normal; but if to the left shoulder, the action is reversed, and acts as the female current. In the recumbent posture the north pole leaves the forehead and takes refuge in the diaphragm. Bringing the hand of the operator in contact with the forehead, no longer now stops the instrument; but if he places his hand over the diaphragm, the motion immediately ceases.

"Another extraordinary fact is, that the magnetic currents are reversed below the pelvis, the right leg having the same action as the left arm, and the left leg having the same action as the right. Again, these change when the body is vertical, and when it is recumbent. These experiments were most satisfactorily proved over and over again, on different individuals in the upright and recumbent positions."

The Earl of Belfast (known to the public as the author of some waltzes) was present at the experiments, and suggested a trial of the influence of some globules of arsenic on the instrument. This brings us to the most important part of the discovery, viz. the value of the instrument as a test of the efficacy of homœopathic remedies. Dr. Quin states—

"One globule of stannum of the fourth attenuation was placed by me in the palm of the hand of Mr. Rutter, after he had set the instrument in action. The pendulum went immediately, moving from B to A with as quick and as strong a motion as when the same metal in mass was put into his hand. One globule of Mercur. sol. 12 changed the action, and the pendulum went from H to E. One globule of Cuprum 30, reversed the normal action, and produced the reverse current. One globule of Zincum 30 sent the pendulum from H to E. Plumbum 30 one globule caused it to move backwards and forwards from D to C. Silica one globule changed the motion to one from H to E. This experiment with the homœopathic infinitesimal quantity of silica greatly gratified Mr. Rutter, as he had only that morning experimented upon flint for the first time. Phosphorus 30 one globule immediately caused a total cessation of the instrument. Opium, motion ceased. Belladonna, ditto. Sulphur, reverse current. Non-medicated globules, no change upon the normal influence of the operator. Stramonium, Sponge, Capsicum, Lycopodium, Filix mas stopped the action. Colocynth, Cannabis, Ignatia, reverse current, &c., &c."

Dr. Quin towards the close of the lecture observes—

"The only reason for sorrow is, that our revered master, Hahnemann, is not alive, to witness this triumphant proof of his own great discoveries."

And in a subsequent lecture he remarks—

"I have witnessed several hundred experiments upon Mr. Rutter's instrument and I have never found it vary once; the same cause repeated invariably produces the same effect. Try the instrument as you will, it never errs; it has all the certainty of a mathematical equation."

On reading the above statement a few questions suggest themselves as affording a field for further inquiry. Would the itch insect stop the action of the instrument as *dead animal matter*? or would it, like sulphur, reverse the action? The instrument ought not to be differently affected by *analogous remedies*. Would the male and female influence respectively be indicated on the instrument by male and female itch insect? * Would a dead bug give the same indications as a dead fly? and would tincture of bugs act the same as the dead body of a bug? Would syphiline or other purulent matter afford the normal indications of "dead animal matter," or give a specific indication denoting its "action on the human organism?" On the supposition that the "subtle and sensitive pendulum" is affected in the manner described, by these attenuated globules, by what process of deduction is it proved that the "homœopathic medicines do act on the human organism?" and what curative property is denoted by the action of the pendulum? There is still a link wanting in the "evidence."

While the ink which gave the first announcement of the great discovery was scarcely dry, a dispute arose among the manipulators on the question of paternity. Dr. Madden, who resides at Brighton, and had co-operated with Mr. Rutter in his early experiments, claimed a slice of the fame. One of Dr. Madden's supporters asserts that "he has had the start, was the first on the course, and has brought to the task qualities and attainments which admirably fit him to conduct and systematise such experiments."

Dr. Quin assumes the dignity of a lion called in to settle a dispute between a wolf and a fox, and says—

"For me to enter into a dispute with Dr. Madden about our respective merits in this matter, would be like raising a storm in a bucket on the sea-shore, near the Black Rock, in which were struggling two small minnows, who imagined themselves great members of the finny tribe, in the neighbourhood of a leviathan—such as Mr. Rutter, is when compared with us in the broad and deep ocean of science."

After sundry discussions and further investigations, the dispute took a different turn, the doctors began to disagree about the "facts," and Dr. Madden made a discovery which stamps him as the great leviathan after all. We give the pith of it in his own words.

"It is, I can assure you, no pleasant duty which I have now to perform, viz., to make known the fact that my recent experiments have detected a source of fallacy in all the previous ones, and go far to show that it will be of little or no value to us as demonstrating the action of homœopathic remedies," (After some remarks on the construction and fallibility of the instrument, he states the following as the result of his "test experiments.") I find, 1st. That in the ordinary condition of the magnetoscope, any motion which is anticipated invariably takes place.—2nd. If I apply merely the point of any of my fingers to the brass ball, and wish for any motion to occur, it takes place immediately, without my being conscious of any muscular motion on my part.—3rd. If a medicine is put into my hands without my having any possible clue to its nature, the motions no longer coincide with my former observations; so much so, indeed, that of six medicines which have been tested in this way four times each, no one agreed more than twice, and two of them gave different motions every time they were tested."

* One of M. Cazenave's pupils, M. Languetin, has just found the male *acarus scabiei* upon the hand of a patient affected with the itch. This *acarus* had long been sought for in vain, and some works on skin disease do not even mention its existence. As this parasite is very small, being less than half the size of the female, it had hitherto escaped detection.—*L. Union Medecale*.

A similar failure is recorded in the report of an experiment with two letters, one written by a lady, the other by a gentleman. Dr. Madden, thinking he held the lady's letter in his hand when he had the other, and *vice versa*, the male and female indications on the instrument were reversed.

Dr. Madden's great discovery has cut short the dispute, and at the same time spoiled the sport. The philosophers are at fault, and instead of discussing rival claims they are beating about for a new scent.

This little event in the history of homœopathy may probably be thought by some of our readers unworthy of the space which it occupies. We think, however, that it is desirable to place on record an incident which serves to throw some light on the process by which this respectable class of philosophers accommodate their facts to their theories. The fortuitous circumstance of a dispute arising between the rival discoverers broke up the clique—the aggrieved party turning Queen's evidence—and the bubble burst. If this accident had not occurred, the magnetoscope might have furnished materials for a long course of lectures by Dr. Quin in the homœopathic hospital, and a series of experiments with ladies' hairs and dead flies in aristocratic drawing-rooms.

A more full and complete account of the rise and fall of the wonderful instrument, and its mysterious performances, may be found in the *Lancet* of November the 15th.

SHEEP-DIPPING COMPOSITION.

THE recent disasters in the West of England, which are reported in another part of this number, point out the necessity of further enquiry as to the mode of employing the sheep-dipping composition. During the investigation which preceded the passing of the SALE OF ARSENIC REGULATION ACT, a mass of evidence was collected respecting the extensive use of arsenic and arsenical compounds for agricultural purposes, and in the framing of that measure care was taken not to interfere with the legitimate use of arsenic for such purposes, of which one of the most important is the dressing of sheep.

So important is this operation considered by most farmers, that they would listen to no arguments tending to divert them from their regular annual dipping. Unless some preventive treatment of this kind is adopted the sheep are infested with the fly, the sheep louse, and other vermin, which create much irritation in the skin, and often produce troublesome sores. By the application of arsenic, an arsenical compound, or some other preparation of a poisonous nature, the vermin, if present, are destroyed, and the deposition of their larvæ is prevented. The sheep thrive and fatten much better; and we have heard it said that the wool is improved. The influence on the wool may probably be rather negative than positive; at all events, the removal of the cause of deterioration increases its value. It is customary for shepherds to carry in their pockets small pieces of corrosive sublimate or arsenic, which they moisten with saliva and apply to the skin when irritated by the fly. This, however, is seldom necessary when the process of dipping has been properly performed.

A farmer lately informed us that during the last season he had dipped all his sheep, except five or six, which he intended to kill almost immediately. From some cause he altered his intention, and all the sheep which had not been dipped were severely attacked by vermin, while the others escaped and turned out remarkably well. This, we believe, is in accordance with the experience of most farmers on the subject.

For many years Mr. Bigg has been in the habit of preparing a composition for dressing sheep; and this branch of trade had increased to such an extent, that he relinquished his former business (that of a chemist and druggist) and devoted his attention exclusively to the preparation of the sheep-dipping compound. He established agencies throughout the country, and the most respectable chemists in the agricultural districts were his principal customers.

About the year 1849, he discovered that some of his agents had introduced

compounds of their own, which partially superseded that of which he had been for many years the principal manufacturer. This led to the discontinuance of some of his agencies, as stated in the late trial. A remedy, the value of which had been so fully established, was not likely to continue for an unlimited period in the hands of one individual, however celebrated the composition might have been. In fact, the fame which Mr. Bigg had acquired as the farmer's friend, by the introduction of so useful a composition, was the exciting cause of rivalry among other Chemists.

Arsenic being the basis of the compound, and soft soap being the most appropriate vehicle, a simple arsenical soap is often used, besides a variety of nostrums more or less resembling Bigg's composition. We have understood that the addition of sulphur is found beneficial, and that an excess of potash is also an improvement. Mr. Bigg, after numerous experiments, arrived at this conclusion, and has for many years employed with almost uniform success, a mixture of sulphur, arsenic, potash, and soft soap. It is a remarkable circumstance, that Mr. Froom's composition, which resembles the above, but is not half the strength, has been attended with so much injury to the sheep, the cause of which has not yet been satisfactorily explained. The chemical evidence given at the trial is contradictory. Dr. Shapter and Mr. Tucker (on behalf of the plaintiff) attribute the mischief to the formation of a soluble arsenite of potash to a greater extent in Mr. Froom's composition than in that of Mr. Bigg, by which means they consider that it is more active and deleterious. Dr. Hulme (on behalf of the defendant) states that no arsenite of potash, or at all events, not an appreciable quantity is formed in either composition, and he attributes the disasters to carelessness in the application.

It is well known that both arsenious acid and arsenite of potash when applied to the skin, especially to an abraded surface, will act powerfully as escharotics. The preparation commonly employed as a depilatory for the removal of superfluous hair is an arsenical compound, and this, when incautiously applied, will destroy the skin and produce serious mischief. It is the object in using such preparations, so to regulate the strength and the period of contact, as to produce a specific result and no more, and in both the cases alluded to, the efficacy depends upon a strict attention to the mode of performing the process.

In dipping sheep, care should be taken not to immerse the head; the sheep should be held in the liquor not more than a minute, and the superfluous portions of liquor and of arsenic should be carefully removed. The object to be obtained, is the saturation of the wool, without leaving any particles of arsenious acid in contact with the skin. We doubt whether the explanation given by Dr. Shapter and Mr. Tucker is the correct one, as mischief has not unfrequently occurred where the arsenious acid was used without potash. In these cases, it is chiefly the back of the sheep which is injured, that being the part in contact with the bottom of the vessel where the arsenic is deposited, portions of which adhere to the wool, and afterwards, unless carefully removed, penetrate to the skin. The solubility of the arsenite of potash, while it increases its activity, affords greater facility for the removal of any superfluous portions by washing and sponging.

In the employment of a preparation of this nature, requiring so much care and attention, it is not fair to throw all the responsibility on the chemist from whom the composition is obtained; and, in case of mischief arising, it is extremely difficult to ascertain precisely where the fault lies. The danger to be apprehended, as the result of carelessness or inattention, is known by both the vendor and the purchaser, and both are equally concerned in the success of the application; the one for his credit as a manufacturer, the other for his interest as a farmer.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING.

THE Evening Meetings were commenced for the season on Wednesday, the 12th of November, and on no former occasion has there been a warmer manifestation of zeal in the objects of these reunions. The rooms were crowded to excess; and in addition to the Members and Associates of the Society, many distinguished scientific men and foreigners were present.

The tables were covered with donations which had been presented for the Museum of the Society, and for the reception of which the Council has recently ordered new glass cases to be erected.

MR. THOMAS HERRING, PRESIDENT, on taking the Chair, said that, having had a seat in the Council of the Society ever since its establishment, and yielding to no one in the interest he felt for the prosperity of the Institution, he was gratified by the honour which had been conferred upon him in electing him to his present office, the duties of which he would endeavour to discharge to the best of his abilities.

DONATIONS TO THE LIBRARY.

Iodognosie, by Dorvault, from the Author.

L'Officine ou Repertoire General de Pharmacie Pratique, by Dorvault, from the Author.

Two copies of an extract from *L'Union Medicale*, by Dorvault, from the Author.

Guibourt's *Histoire Naturelle des Drogues Simples*, Vol. iv., from the Author.

Quarterly Journal of the Chemical Society, Nos. 14 and 15, from the Society.

The New London Pharmacopæia, translated and arranged in a tabular form with the *Edinburgh and Dublin Pharmacopæias*, by Peter Squire, M.R.I., &c. &c., 1851. Presented by the Author.

A Practical Analysis of Seventy Cases of Diseases of the Heart, by Dr. Scott Allison, from the Author.

DONATIONS TO THE MUSEUM.

From Messrs. Howards and Kent.—A glasscase containing upwards of forty specimens of cinchona barks, with the various salts of quinine and cinchonine derived from them. This collection formed a prominent feature in the Chemical and Pharmaceutical department of the Great Exhibition, and it has been presented in the state in which it was exhibited there, for the Museum of the Society. The collection of barks is a very valuable and interesting one.

From Messrs. Powers and Weightman, of Philadelphia, per Mr. Cole.—Specimens of citrate of quinine, iodide of quinine, ferrocyanide of quinine, arsenite of quinine, acetate of quinine, valerianate of quinine, valerianate of morphia, picrotoxin, menispermis, cubebin, piperin, santonin, bromide of potassium, potassio-tartrate of antimony, Kermes mineral, iron reduced by hydrogen, citrate of iron, citrate of iron and quinine, tannate of iron.

From Messrs. Allen & Co., Plough Court.—Two specimens of Calumba wood, specimens of nutmegs in the shell, wild nutmegs, wild nutmegs with the mace, wild nutmegs in the shell, Dutch or Batavian nutmegs, Singapore wild mace, Sicily almonds, Barbary bitter almonds, African ginger, Malabar ginger, old Malabar ginger, Cochin ginger, Bencoolen cloves, Malabar cloves, Zanzibar cloves, Nirmalees, African bdellium, dragon's blood, dragon's blood in reed, Burgundy pitch, ditto strained, prepared crab's stones, prepared crab's claws, prepared pearls, prepared red coral, cinnamon, specimen of oil of ginger grass.

From Mr. Daniel Hanbury.—Specimen of *Cytinus hypocistus*, *Succus hypocistidis*, seeds of *Euphorbia lathyris*, Troches of Vipers, hoofs of the elk.

From the London Druggist's Collection of Drugs, recently exhibited at the Great Exhibition.—Specimens of East Indian Rhubarb, galbanum, galbanum Gt., ammoniacum (lump), gamboge, opoponax, elemi, guaiacum, Siam benzoin, virgin scammony, vanilla, mudar bark, large crystals of bay salt, hopper-shaped or maldon salt, red prussiate of potash (shade and stand).

From Dr. Pereira.—Specimens of *Fungus melitensis*, chay root or Indian madder,

a root from **Granada**, **arctopus root**, scammony, Borden's meat-biscuit powder, meat and semola, **Tanqueray's dried potato**, dried cabbage, dried gluten, kokum fat, a root found in **Jalap**.

From **Mr. Bushell**.—**Balm of Mecca**.—This specimen was brought from Constantinople, **about sixty years since** by the late Sir Robert Ainslie, Bart., who had been ambassador there about twenty years, and was succeeded by the late Lord Elgin. It was given to him by one of the **Sultanas**, being in use to burn as incense in the Seraglio.

From **Dr. Ure**.—Five specimens of cinnamic acid, specimen of crystallized lead.

From **Messrs. Hahnel and Ellis**, Manchester.—Group of crystals of nitrate of lead, specimens of litharge, sublimed sulphur.

From **Gerardo José de Nobrega**, Madeira.—Leaves of the tea plant, specimen of dragon's blood.

From British Guiana, presented by Mr. Ridgeway, of Leicester Square, agent to the Exhibitors at the Great Exhibition

Maize or Indian Corn.—Contributed by A. D. Vander Gon Netscher.

Meal from Maize or Indian Corn.—Contributed by A. D. Vander Gon Netscher.

Plantains.—Contributed by A. D. Vander Gon Netscher. (*Musa paradisiaca*, Lin.) Unripe, sliced, and dried in the sun.

Plantain Meal, or Conquin Tay.—Contributed by A. D. Vander Gon Netscher.

Meal from the Bitter Cassava.—Contributed by H. T. Garnett.

Capsicums, Dried Capsules of.—Contributed by David Shier.

Capsicums.—Contributed by David Shier. Preserved in dilute acetic acid.

Capsicums.—Contributed by David Shier. Known as Yellow Bonnet Peppers, preserved in dilute acetic acid.

Capsicums.—Contributed by David Shier. Active principle of, extracted by olive oil.

Capsicums.—Contributed by David Shier. Active principle of, extracted by vinegar.

Birambi, Fruit of a Shrub, called.—Contributed by T. B. Duggin.

Limes.—Contributed by A. D. Vander Gon Netscher. Preserved in pickle.

Kasareep.—Contributed by J. S. Stutchbury.

Saline Ash.—Contributed by J. Outridge. Used by the Indians as a substitute for salt.

Turmeric Root.—Contributed by J. S. Stutchbury. Preserved in dilute acetic acid.

Arrowroot.—Contributed by H. T. Garnett.

Starch.—Contributed by H. T. Garnett. From the bitter cassava.

Starch.—Contributed by David Shier. From the sweet cassava.

Starch.—Contributed by David Shier. From the plantain.

Starch.—Contributed by David Shier. From Buck yam.

Copaiba, Balsam of.—Contributed by J. S. Stutchbury. From River Pomeroon, Essequibo.

Milk from the Cow Tree.—Contributed by J. Outridge. From River Demerary.

Gum Resin.—Contributed by T. B. Duggin. From the simiri, or locust tree.

Karman.—Contributed by G. R. Bonyun.

Hyawa Gum or Incense. Contributed by J. Outridge.

Laurel Oil.—Contributed by J. S. Stutchbury.

Crab Oil.—Contributed by J. S. Stutchbury.

Dari or Dali Tree, Seeds of.—Contributed by T. B. Duggin.

Sand-Bax Tree, Seeds of.—Contributed by David Shier.

Lana Tree, Fruit of.—Contributed by H. A. Koch.

Lana Dye.—Contributed by H. A. Koch.

Indian Paint.—Contributed by J. Outridge.

Mora Tree, Bark of.—Contributed by T. B. Duggin.

Hog Plum Tree, Bark of.—Contributed by T. B. Duggin.

Courida Tree, Bark of.—Contributed by David Shier.

Hy-ari, or Hai-ari.—Contributed by David Shier.

Yarrimari, Fruit of.—Contributed by H. A. Koch. From River Berbice. This is stated by the contributor (Dr. Koch) to be the fruit of a vine found in the interior of the colony, and which he claims the merit of having discovered to be the chief ingredient of the celebrated Wourali poison.

Angostura Bark.—Contributed by J. S. Stutchbury.

Rhizophora, or Mangrove Bark.—Contributed by J. S. Stutchbury.

Trysle Bark.—Contributed by J. Outridge.

Greenheart Tree, Bark of.—Contributed by J. S. Stutchbury.

Job's Tears.—Contributed by T. B. Duggin.

Soap Berries.—Contributed by George Ross.

Barricarri, Seeds called.—Contributed by Mrs. Manget.

Guinea Pepper, or Grains of Paradise.—Contributed by J. S. Stutchbury.

Alpinia, or Shell Plant, Seeds of.—Contributed by J. S. Stutchbury.

Physic Nuts, Seeds of.—Contributed by David Shier.

Physic Nuts, Seeds of.—Contributed by E. A. Manget.

Quassia Bitter.—Contributed by Mrs. Arringdell.

Boeiari, Bush Rope.—Contributed by J. S. Stutchbury.

Tonkin Bean.—Contributed by J. S. Stutchbury.

Tonkin Bean in Capsule.—Contributed by J. S. Stutchbury.

Buck Shot, or Seeds of Canna.—Contributed by J. S. Stutchbury.

Isinglass.—Contributed by Morison and Knox. From the Gilbagre, or Gilbacker. This is the sound of the *Silurus*—? a fish very abundant in the estuaries of the rivers of this colony.

Honey.—Contributed by J. F. Bee.

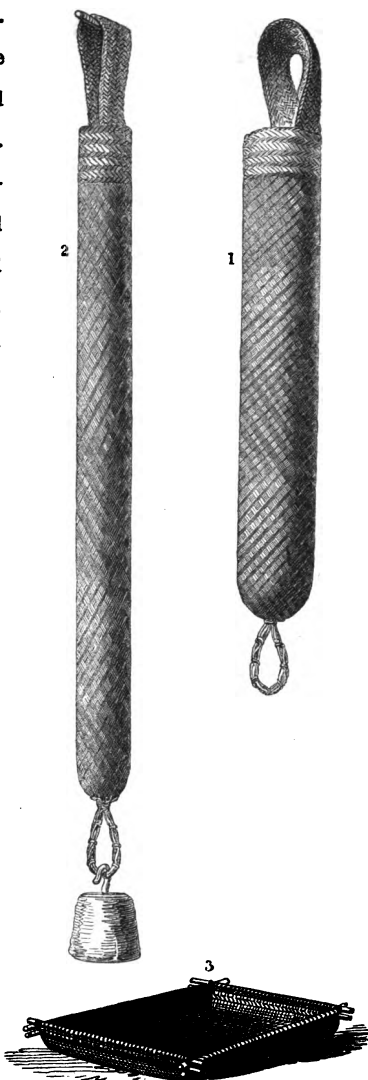
Matapi, or Cassava Squeezer. Contributed by David Shier. Made of the Ita Palm. Used by the Indians for expressing the juice from grated cassava. Before being filled, it is compressed as far as possible, so as to increase its diameter; it is then filled and suspended from a beam, and a lever is inserted into the lower loop, to the long end of which a weight is applied, by which the matapi becomes elongated. It will be observed that the change of form in the vessel will tend to diminish its cubic contents, and when stretched to its utmost length its capacity will be diminished by nearly one-third: hence its applicability for effecting expression.

Etami, or Cassava Sifter.—Contributed by J. F. Bee.

FIG. 1. Cassava Squeezer compressed.

FIG. 2. Ditto elongated.

FIG. 3. Cassava Sifter.



DISTRIBUTION OF PRIZES IN THE SCHOOL OF PHARMACY.

THIS being the first meeting since the conclusion of the session 1850-51, the prizes which were then awarded to the successful competitors, at the examinations were distributed on the present occasion. Handsomely-bound books, as first and second prizes, and certificates of merit, were handed by the President to the following Students:—

MATERIA MEDICA.

FIRST PRIZE ... Mr. Richard Reynolds.

SECOND PRIZE... Mr. T. B. Groves.

CERTIFICATES OF MERIT 1. Mr. H. T. Watts.

2. Mr. Henry Whitfield.

CHEMISTRY AND PHARMACY.

FIRST PRIZE	Mr. Richard Reynolds.
SECOND PRIZE.....	Mr. T. B. Groves.
CERTIFICATES OF MERIT	1. Mr. H. T. Watts.
	2. Mr. Edward Wood.
	3. Mr. William Squire.

BOTANY.

FIRST PRIZE.....	Mr. Richard Reynolds.
SECOND PRIZE.....	Mr. Henry M. Witt.
CERTIFICATES OF MERIT	1. Mr. William Hill.
	2. Mr. William Jackson.
	3. Mr. Edward Wood.
	4. Mr. Charles Parker.

The following were the Questions for Examination in the several classes:—

CLASS OF MATERIA MEDICA.

EXAMINER, DR. PEREIRA.

1. Describe the formation and structure of ergot of rye; and compare the structure and composition of the diseased with healthy rye grains. How are oil of ergot and the extract of ergot (Bonjean's ergotine) prepared?
2. What are the officinal substances obtained from the natural order *Euphorbiaceæ*? Give a sketch of their pharmacological history.
3. A man attempted to poison a family by a powder which is believed to be the powder of nux vomica adulterated with the dust of guaiacum wood. By what characters can the poison and its adulteration be detected?
4. For what practical purposes in Pharmacy is the polariscope applicable? and what inferences do you draw from the indications which it furnishes as to the constitution of some of the oleo-resins, and the effect of submitting them to distillation?
5. Give a sketch of the natural and pharmaceutical history of the several sorts of sarsaparilla found in English commerce.
6. How are the plants of the natural order *Solanaceæ* distinguished from those of *Scrophularineæ*? Enumerate the medicinal plants obtained from each of these orders.
7. By what characters would you distinguish wheat-starch from rice-starch—West Indian, or Maranta arrow-root from East Indian or Curcuma starch—potato-starch from *tous-les-mois*—and sago-meal from tapioca-starch?
8. Give a brief botanical description of the natural orders *Algæ* and *Lichenes*; enumerate the officinal substances obtained from them; and state the chemical properties and pharmaceutical and medicinal uses of these substances.
9. Name the substances marked 1, 2, 3, 4, 5, and 6.

[Candidates may avail themselves of the use of a microscope in answering the last question.]

CHEMISTRY AND PHARMACY.

EXAMINER, MR. REDWOOD.

1. What is the law, usually called Mariotte's law, relating to the influence of pressure on gases?
2. Describe the phenomena which have been observed in connexion with what is called the diffusion of gases, and the laws established in relation thereto.
3. What is the latent heat of water, and how is it determined? What are the amounts of heat respectively absorbed in the conversion of a pound of boiling water into steam, and in the evaporation of a pound of water, exposed to the air, at 150°? What is the meaning of the term specific heat?
4. Describe the best processes for the preparation of oxygen, chlorine, nitrous oxide, and cyanogen gases, and the properties of these bodies.
5. What is the action of *diluted sulphuric acid* and of *strong oil of vitriol*, with and without the application of heat, on iron, copper, zinc, and mercury?
6. Describe the processes of the Pharmacopœia for the preparation of oxysulphuret of antimony, and potassio-tartrate of antimony.
7. Describe the processes for the preparation of cyanide of potassium, cyanate of

potash, and cyanate of ammonia; the relation of cyanate of ammonia to urea, and the products of the decomposition of urea by heat.

8. Describe some of the processes by which organic bases have been produced by artificial means.
9. What are the best methods of determining the strength and purity of the following substances:—diluted hydrocyanic acid, nitric acid, liquor potassæ?

CLASS OF BOTANY.

EXAMINER, MR. BENTLEY.

1. Describe the different forms of fibro-vascular tissue in plants, and mention the classes and organs in which they respectively occur.
2. What is the structure of the general integument of plants? also enumerate and describe its appendicular organs.
3. Describe the structure of the leaves of dicotyledonous plants (both aerial and submerged), and state the characteristic distinctions between dicotyledonous, monocotyledonous, and acotyledonous leaves.
4. Describe fully the function of absorption in plants, and mention the course which the fluids take after they have been absorbed.
5. What is the structure of the pistil? describe its different parts, and enumerate and explain the different kinds of placentation.
6. Define, and give examples of the following fruits:—Follicle, capsule, cremocarp, silique, silicula, glans, berry, and cone.
7. Describe the process of fertilization according to the generally-received opinion, and then mention the views of Schleiden with regard to it.
8. What is the seed? describe its structure, and manner of germination, and state the differences between the germination of acotyledonous, monocotyledonous, and dicotyledonous plants.
9. Give the essential characters of the following natural orders: Cruciferae, Leguminosae, Umbelliferae, Labiatae, Gentianaceae, Solanaceae, Aristolochiaceae, and Araceae.
10. Distinguish the compositae from the dipsacaceae, valerianaceae, and lobeliaceae, also the labiatae from the scrophulariaceae and boraginaceae.
11. To what classes, sub-classes, and natural orders, would plants possessing the following characters belong?
 - a. Calyx inferior; corolla, monopetalous; stamens epipetalous, equal in number and opposite to its segments; ovary with a free central placenta; fruit a capsule.
 - b. Sepals 5, imbricate, petals 5, twisted in aestivation; stamens 5, hypogynous; ovary with 5 cells, 5 styles and capitate stigmas. Fruit a plurilocular capsule; leaves simple, entire and exstipulate.
12. Give a sketch of the artificial system of Linnaeus, and give your opinion as to the comparative value of natural and artificial systems.

OBSERVATIONS ON THE STRENGTH OF TINCTURE OF OPIUM.

BY A. B. GARROD, M.D.,

Professor of Materia Medica at University College, and Physician to University College Hospital.

As many discrepant statements are to be found in works on Materia Medica, in various Dispensatories, &c. concerning the strength of the tincture of opium of the London Pharmacopœia, it may not be either uninteresting or uninteresting at least to the Medical Profession, to have the subject brought under notice and discussion at this society, in order that they may arrive at some definite conclusion concerning the strength of a preparation they are in the daily habit of prescribing. If we refer to the London Pharmacopœia of 1836 we find the following directions for making the tincture of opium:—

Take of hard opium powdered, 3 ounces

Proof spirit, 2 pints

Macerate for fourteen days, and strain.

In the Pharmacopœia of 1851 we are ordered to—

Take of Opium powdered, 3 ounces

Proof spirit, 2 pints

Macerate for seven days, press out, and strain.

The only difference in the directions being that powdered *hard* opium, and digestion for *fourteen* days, are ordered in the one case, and simply powdered opium and seven days digestion in the other. If we look at the authorised edition of the *Pharmacopœia* by Mr. Phillips of 1836 (and also at the present edition) we find stated, that the preparation has a deep brownish red colour, possesses the peculiar odour and taste of opium, has sp. gr. 0.952, and about 19 minims contain 1 grain of opium, which is said to be proved by the following data: 1st, by evaporating the tincture, and finding the amount of solid extract left; 2d, by ascertaining the quantity of opium remaining undissolved. The conclusion at which Mr. Phillips arrived, viz., that 1 grain of opium was contained in 19 minims of the *Pharmacopœia* tincture, has been copied into most English works on *Materia Medica*, and most medical men have been and are still in the habit of prescribing the tincture considering it to be of the *above* strength. Were Mr. Phillips's conclusions correct?

With regard to the amount of solid extract left on evaporation of the tincture, it appears from the experiments of Mr. Allchin, which are also confirmed by those which I have myself made, that 19 minims yield about 1 grain of extract; but in these cases the Turkey opium of commerce must be first exsiccated; and the tinctures of commerce yield quantities varying from 1 in 19 to 1 in 28 minims of the tincture. Tincture of opium made with Turkey opium in small masses not previously dried, fl. 3j. gave on drying 2.7 of solid residue, or 1 grain in about 22.2 minims. Tincture of opium made with good Turkey opium, previously dried and reduced to powder (*Pharmacopœia* directions) fl. 3j. gave on drying—three experiments—3.1, or 1 grain of residue in 19.3 minims.

If made with opium capable of being reduced to a state of powder, the average quantity of extract would be about 1 grain in 20 minims; this proportion would indicate that one-third of the solid ingredient (opium) is left undissolved, which was found by Mr. Phillips to be the case. I believe all good specimens of Turkey opium yield about this amount of residue. An experiment made within the last week at Mr. Bell's establishment gave this result. If then the strength of tincture of opium be considered to be that indicated by Mr. Phillips, we must assume that the undissolved portion possesses the same therapeutic effects as the dissolved portion. Is this correct?

It has been stated by some that morphia can be extracted from the residuum, and in Dr. Pereira's *Materia Medica*, we find the following observations: "Proof spirit dissolves the same constituents as water does, but it takes up a larger proportion of *narcotine*, *resin*, *oil*. I have repeatedly prepared morphia from the insoluble residue left behind in the preparation of the tincture." Again, in Dr. Thomson's *Dispensatory* it is stated that Mr. Brande finds that the whole of the morphia is not taken up; but is found in no inconsiderable quantity in the filter. We suspect occasionally *narcotine* has been taken for *morphia*,* and in the cases where *morphia* has really been found, unless the residue had been previously washed, an error may have arisen from the alkaloid being contained in the tincture of opium adhering to the dregs, and not from any contained in the residue itself. I have recently endeavoured to ascertain the true state of the case, and chiefly by means of a therapeutic inquiry into the strength of the residuum. The residue of tincture of opium prepared in the ordinary way at University College Hospital, was taken for experiment; it was first washed

* In the sixth edition of Dr. Thomson's *Dispensatory*, page 1061, the following method is given for obtaining "Meconate of Morphia," extracted from the *Quarterly Journal of Science*, vol. xx., from which it will be at once observed, that *narcotine* was mistaken for crystallized *Meconate of Morphia*.

"Reduce good Opium to powder, put it into a paper filter, add distilled water to it, and slightly agitate it; and in this way wash it till the water passes through colourless, after which, pass a little diluted alcohol through it; dry the insoluble portion (now diminished to one-half) in a dark place; digest it, when dry, in strong alcohol for a few minutes, applying heat; separate this solution, which by boiling, and after evaporation, will yield crystallized Meconate of Morphia of a pale straw colour."

with a little cold water to remove any adhering tincture, and afterwards dried in a water-bath. By digestion with ether, it was found to yield abundance of *narcotine*, and was also found to contain *meconic acid* sufficient to strike a claret colour with the persalts of iron; but at the same time nitric acid gave no evidence of the presence of *morphia*. It was found also by experiment that proof spirit at the ordinary temperature dissolved but a very small portion of *narcotine*; the bulk of the *narcotine* therefore remains in the residuum from the tincture of opium, perhaps united with *meconic acid*; for when treated with water acidulated with acetic acid, both *narcotine* and *meconic acid* were dissolved.

A portion of the residue was given internally; *one grain* to a healthy adult produced no effect; *two grains* were given with no result; the dose was then successively increased to *four grains*, then to *six grains*, afterwards to *thirteen*, and lastly to *thirty grains*, without causing the slightest effect on the individuals to whom it was administered; the only limitation to the quantity given being the unpleasantness of taking so large an amount of so bulky a matter. It appears, therefore, that the residue is, to all intents and purposes, inert.

From these experiments, it is evident that even *should* traces of *morphia* be contained in the dregs, still the quantity must be such (when the tincture is prepared according to the London Pharmacopœia) as to make no appreciable diminution of the strength of the preparation, and that the *tinctura opii* contains the active matter of the whole of the drug used in its formation, and therefore about 12 minims of tincture of opium possesses all the activity of 1 grain of crude opium, assuming that it loses only 12 per cent. in the drying. If dry opium is taken for comparison, 1 grain is contained in about $13\frac{1}{2}$ minims; and, therefore, *one fluid drachm* of *tinctura opii* contains about 5 grains of the drug, or $4\frac{1}{2}$ grains (according as it is compared with the dry or moist opium), in place of 3 grains; or 1 fluid ounce contains 40 or 36 grains in place of 24 grains usually assumed to be contained in it: a difference of strength of the highest importance when we consider the highly poisonous and powerful therapeutic action of the drug.

In the Edinburgh preparation the amount of tincture containing a grain of opium is about $13\frac{1}{2}$ minims, for the opium is ordered in the same proportion but not previously reduced to powder or dried. In the Dublin preparation the opium is ordered to be coarsely powdered, but *avoirdupois* weight is used in place of apothecaries, which makes the strength of the tincture such that 12.75 minims contain *one grain*.

The error as to the strength of the tincture of opium, which is found in so many works, has been recently commented on. Thus Dr. Christison objects to Mr. Phillips's statements; Dr. Royle also alludes to it, and so does Mr. Squire, in his recent work on the Pharmacopœias; and even those writers who have copied the statement must have done so without much thought on the subject, as they have calculated the strength of other preparations of opium, as that of the *tinctura opii ammoniata*, *tinctura camphoræ composita*, assuming that all the active properties of the opium used in the preparation had been taken up by the menstrua. And this is the case even with Mr. Phillips himself, in the case of the compound tincture of camphor, when he states that *nearly two grains* of opium are contained in the ounce, the Pharmacopœia proportions of opium being 1.6 grains only.

I have brought the question before the Society more for the purpose of eliciting the opinions of the members on the point, than with the idea of bringing forward much that is novel on the subject; if the conclusion to which we have arrived, namely, that 12 minims of tincture of opium contain all the medical properties of 1 grain of the crude drug, I think it very important that the members of the medical profession should be made fully aware of the delusion under which they have laboured for so many years with regard to the strength of this important preparation.

THE SUSPENSION OF DR. PEREIRA'S LECTURES.

IN accordance with the resolution of the Council, passed on Wednesday, the 19th of November, the following Correspondence is published in the Transactions of the Society.

Finsbury Square, Oct. 15, 1851.

MY DEAR MR. PRESIDENT,—I am anxious to draw the immediate attention of yourself and the other Members of the Council of the Pharmaceutical Society to the publication, in a weekly journal, of the lectures delivered by me at the Society's house; and to the announcement of the Editor that numerous Members of the Society have spontaneously offered to furnish the reports, which will appear in the journal referred to.

As my engagement with the Society relates only to the delivery, not to the publication, of my lectures, it is obvious that the Society does not possess the legal power of publishing or of authorizing others to publish my lectures. The law has vested in me, or my assignees, the sole right of publishing them; and that right I have hitherto reserved to myself, and am determined to maintain.

In the "*Act for preventing the Publication of Lectures without consent*" (5 & 6 Will. IV., chap. 65), it is stated in the preamble that "printers, publishers, and other persons have frequently taken the liberty of printing and publishing lectures delivered upon divers subjects, without the consent of the authors of such lectures, or the persons delivering the same to the public, to the great detriment of such authors and lecturers;" and the Act then goes on to declare that the author or assignee of lectures "has the sole right of publishing them." It also imposes certain penalties on every person who obtains, by taking down in short-hand, or through any other means, a copy of the lectures, and publishes them without leave of the author or his assignee, and on every person who knowingly sells, or offers for sale, lectures so unlawfully published. And in the third section of the Act it is expressly stated, that persons allowed, on payment of fees, to attend lectures, are not licensed, on that account, to publish them.

I am willing to believe that the person or persons who have undertaken to report, without my consent, the lectures delivered by me at the house of the Pharmaceutical Society, were not aware of the illegality of the act they have engaged in. But as such person or persons have been admitted to my lectures by the authority of the Society, it becomes my duty to appeal to the Council for protection against this piratical publication.

I am, my dear Mr. President,

Very faithfully yours,

JON. PEREIRA.

THOMAS HERRING, Esq.,

President of the Pharmaceutical Society, &c. &c.

At a SPECIAL MEETING of the COUNCIL, held on Thursday, the 16th of Oct.,

THE PRESIDENT IN THE CHAIR,

Dr. Pereira's letter of October 15 having been read, it was

Resolved, That, as Dr. Pereira objects to the publication of his lectures delivered at this Institution, this Council considers that it has not the power to grant permission to any individual to take notes with a view to their publication.

47, Finsbury Square, Nov. 13, 1851.

DEAR MR. PRESIDENT,—In my letter to you of the 15th of October last, I drew the attention of the Council of the Pharmaceutical Society to the fact, that some person or persons, admitted to my lectures by the authority of the Society, had commenced the publication of the lectures in a weekly periodical without

my consent, and I requested the protection of the Council against this piratical publication.

I am informed, that on the 16th of October, the Council passed the following resolution: "That as Dr. Pereira objects to the publication of his lectures delivered at this Institution, this Council conceives that it has not the power to grant permission to any individual to take notes with a view to their publication."

I find, however, that the publication of garbled and imperfect reports of my lectures is still persisted in; and in the last number of the periodical referred to, the following statement appears:

"We beg to inform our readers, that on the completion of Dr. Pereira's lectures, we shall re-publish them in the shape of a book, the sheets of which (for the purpose of insuring their accuracy), will be sent to Dr. Pereira for correction."

Such an announcement unauthorized by me, after what has transpired, needs no comment.

Under the circumstances, I have come to the determination to suspend the Course until the Council shall have taken such steps as may be requisite to prevent the continuance of these dishonest proceedings.

I am, my dear Mr. President,

Very faithfully yours,

THOS. HERRING, Esq.,
President of the Pharmaceutical Society.

JON. PEREIRA.

MEMORIAL

To the Council of the Pharmaceutical Society of Great Britain.

GENTLEMEN,—The undersigned Members, Associates, Registered Apprentices, and Students of the Pharmaceutical Society, who have entered to the class of *Materia Medica* for this session, beg to address you on the subject of the suspension of the lectures by Dr. Pereira. We are informed that our Professor has taken this step in consequence of some Member or Members of the class having surreptitiously supplied reports of the lectures for publication in a manner calculated to prove injurious to the interests of the lecturer and of this Institution; and being anxious to exonerate ourselves from the suspicion of being in any way implicated in such dishonourable conduct, we present herewith a DECLARATION, which, as you will perceive, is signed by nearly all who have entered to the class. We beg respectfully to represent to the Council that we consider the educational arrangements of this Institution to be the most valuable and important of the objects contemplated in the establishment of the Society. We highly estimate the privilege of attending the very valuable lectures of Dr. Pereira, and trust that you as the representatives of the Members, and guardians of the interests of the Society, will not suffer the ill-conduct of two or three individuals to deprive us and others of this great privilege.

Signed, CHARLES COTTON,
&c. &c.

The other signatures are the same as those attached to the following Declaration.

DECLARATION.

We, the undersigned, who have entered to the class of *Materia Medica* at the Pharmaceutical Society for the present Session, being informed that our Professor, Dr. Pereira, has suspended the further delivery of the lectures, in consequence of some Member or Members of the class having, without his sanction, and in violation of the law, supplied reports of the lectures for publication, in a manner calculated to convey an erroneous impression of their value, and therefore injurious to the reputation of the lecturer, and detrimental to the interests of the Institution to which he is attached, hereby declare that we disapprove of the conduct which has caused the suspension of these most valuable lectures, and emphatically deny any participation in their publication.

CHARLES COTTON
JAMES GRIMSDALE
S. B. TURNER
E. R. PETTIFER
T. O. M. E. WILLS
MAURICE HOWELL
RICHARD FORREST
ROBERT PARKINSON
WALTER BENTLEY
WILLIAM M'CREE
JOHN J. FENN
FRANCIS MIDDLETON
JOHN KENT SPENDER
WILLIAM HILL
EDWIN APPELGATE
WILLIAM STEPHENS
SAMUEL PICCIOTTO
T. HANDSLEY
GEO. D. STUBBS
JAMES J. STRANGE

JOHN PARKER
JOHN BELLWOOD
HENRY FRANCIS
SAMUEL GALE
H. S. BOND
CHARLES WALKER
LEWIS OPPENHEIM
HENRY BARLOW
LLEWELLYN THOMAS
HENRY M. WITT
JOHN HANDLEY
THOMAS FRANKLYN
ROBERT WOODWARD
CHARLES CRACKNELL
THOMAS DAINES
CHARLES JOHN STEWART
JOHN LIMBERT
JAMES BELL
AUGUSTUS B. NORTHCOTE
JAMES PEEL

THOMAS GREGORY
EDWIN TURNER
SAMUEL A. SMITH
EDMUND GREAVES
THOMAS BURDEN
ALFRED WITTY
CHARLES BOORNE
J. W. JOY
J. C. BRAITHWAITE
GEO. KERSHAW
J. E. JENNINGS
JAMES RICHARDS
GEORGE FRANCIS
JAMES DAVIDSON
LINDSEY BLYTH
FREDERICK J. CHARD
JOHN S. COBB
E. W. BURDEN
HENRY B. COCKSEGE

At a SPECIAL MEETING of the COUNCIL, held on Wednesday, November 19,

THE PRESIDENT IN THE CHAIR,

Dr. Pereira's letter of November 13th, and the MEMORIAL and DECLARATION from the class having been read, it was

Resolved unanimously, That in the opinion of this Council the publication of Dr. Pereira's lectures without his consent, and in defiance of his remonstrance, is piratical and dishonest: that the copyright of the lectures being the property of Dr. Pereira, the infringement of this copyright by any persons connected with the Pharmaceutical Society is a breach of faith which not only justifies Dr. Pereira in suspending his engagement, but makes it incumbent on the Council to adopt such measures as may be requisite for his protection in the event of his resuming the lectures:

That, for this purpose, no persons be admitted to the remaining portion of the course except those connected with the Society, or candidates for admission, and persons specially invited by the Council or by Dr. Pereira:

That Dr. Pereira be earnestly requested to resume his lectures upon receiving an assurance signed by the class individually to the effect that they will adhere to the spirit of the arrangement mutually entered into between the Society and himself.

Resolved, That the correspondence relating to the suspension of Dr. Pereira's Lectures on *Materia Medica*, be published in the Transactions of the Society.

A copy of the above resolution relating to the publication of Dr. Pereira's lectures having been forwarded to the Class, the following Address was prepared, signed, and transmitted to Dr. Pereira:—

To JONATHAN PEREIRA, M.D., F.R.S., Professor of *Materia Medica* to the Pharmaceutical Society.

HONOURED SIR,—The announcement of the suspension of your lectures on *Materia Medica* at the Pharmaceutical Society, and especially the intimation that it had been caused by the misconduct of some member or members of the class, who have been guilty of a breach of the confidence which ought to exist between a Professor and his pupils, having created a feeling of deep regret among the class, a committee was appointed to take such steps as might be deemed necessary to exonerate those who had not participated in the dishonourable conduct referred to. A Declaration and Address were presented to a Special Meeting of the Council of the Society, held on the 19th inst., and

in reply thereto the copy of a Resolution of the Council has been received, in which it is stated,—

"That Dr. Pereira be earnestly requested to resume his lectures, upon receiving an assurance signed by the class individually, to the effect that they will adhere to the spirit of the arrangement mutually entered into between the Society and himself."

In compliance with this Resolution, we beg to present to you a Declaration to the above purport, signed by a large proportion of those who originally entered to the class, and we now trust that you will be induced to resume your lectures, and that your pupils will not again be deprived of the benefit of your instruction by the repetition of conduct which has been denounced as piratical and dishonest by the unanimous decision of a special Council of the Society.

(Signed)
 CHARLES COTTON, *Chairman*, } Of the Committee
 JAMES GRIMSDALE, *Secretary*, } of the Class.

17, Bloomsbury Square, Nov. 21, 1851.

Pharmaceutical Society of Great Britain.—Lectures on Materia Medica.

WE, the undersigned, who have entered to the class of *Materia Medica* at the Pharmaceutical Society for the session 1851-52, fully recognizing the just claim of the lecturer to the copyright of his lectures, hereby declare that we will not directly or indirectly contribute to the publication of the lectures delivered by our Professor without his consent; and that we will use our best endeavours to protect him from the unjust interference with his rights, to which he has been recently subjected.

CHARLES COTTON
 RICHARD FORREST
 S. B. TURNER
 WALTER BENTLEY
 E. H. PETTIFER
 FRAS. MIDDLETON
 EDWIN APLEGATE
 SAMUEL PICCIOTTO
 THOMAS DAINES
 JAMES J. STRANGE
 JOHN S. FENN
 JAMES PEEL
 JAMES RICHARDS
 R. C. WOODWARD
 THOMAS BURDEN
 JOHN S. COBB
 HENRY B. COCKEDGE
 EDWARD PITMAN
 ROBERT PARKINSON

JAMES BELL
 THOMAS GREGORY
 CHARLES WALKER
 LEWIS OPPENHEIM
 THOS. FRANKLYN
 JOHN HANDLEY
 FRED. J. CHARD
 H. FRANCIS
 SAMUEL GALE
 MAURICE HOWELL
 JAMES GRIMSDALE
 THOS. D. WILLS
 JOHN KENT SPENDER
 JAMES DAVIDSON
 CHARLES CRACKNELL
 JOHN PARKER
 HENRY W. WITT
 CHARLES REGNAUD
 J. C. BRAITHWAITE

EDMUND GERAVES
 R. B. DICKINSON
 H. F. BOND
 HENRY BARLOW
 SAM. A. SMITH
 WILLIAM STEPHENS
 WILLIAM M'CREE
 ALFRED WITTY
 AUGT. B. NORTHCOTE
 CHARLES BOORNE
 LLEWELLYN THOMAS
 GEO. O. STUBBS
 JNO. LIMBERT
 JOHN BELLWOOD
 WILLIAM HILL
 T. W. JOY
 J. D. WARD
 FREDERIC VARNES

The Address was handed to Dr. Pereira by a deputation, and on the understanding entered into by the Class, the Professor consented to resume his lectures on Tuesday, the 25th of November, on which occasion he was most enthusiastically greeted by the pupils, and the following names were added to the declaration:—

T. HANDSLEY
 HENRY M. WITT
 HENRY LORRY
 PETER SQUIRE

J. K. SPENDER
 C. J. STEWART
 J. L. CHAPLIN
 JAMES S. WATT

JACOB BELL
 T. H. HILLS
 WM. DICKINSON

LIVERPOOL CHEMISTS' ASSOCIATION.

Royal Institution, Second Annual Meeting, Sept. 21, 1851.

THE PRESIDENT IN THE CHAIR.

THE SECRETARY read the Annual Report, which was unanimously passed with the accounts :—

Liverpool Chemists' Association, Royal Institution, Nov. 21, 1851.

SECOND ANNUAL REPORT OF COUNCIL.

YOUR Council congratulate the Society on the occasion of its second anniversary, and regret that a succession of unavoidable circumstances has prevented them from calling this meeting at the proper time: viz., in June last.

It was expected that, during the second year of the Society's existence, many difficulties would present themselves; which, if successfully overcome, would tend to consolidate and strengthen, although, for the time, might seriously threaten its future welfare. Of these we have had our share. On the whole, however, the Council consider they may congratulate the members on the measure of success they have attained, and the degree of progress ensured; and, although they now find the Society fewer in numbers than at first, they trust that sufficient interest is now felt in the great object of pursuit to form a permanent bond of union and of exertion on the part of those who now compose the body. It is to this feeling, on the part of each individual member, the Society must owe its existence and prosperity, and without which the utmost efforts of the Council will be fruitless. The gauge of this interest is the attendance of members at the Pharmaceutical Meetings; and, in proportion as these are supported by the presence of principals, will their efficiency be increased, and the benefits to be derived from them extended and enlarged. During the past year these meetings have, on the whole, been well supported, and excellent lectures have been delivered; and the Council take this opportunity of thanking the many contributors both for their past and promised assistance. At the same time they recommend for the future, the adoption of fortnightly meetings, during the winter months, as calculated to increase the interest and attendance of members.

It will be observed, that the funds of the Society have been principally appropriated to the education of the Associates in the Laboratory; and it is much to be regretted, that a larger number of young men have not joined the Society, and availed themselves of the peculiar advantages its Laboratory arrangements offer them. At the same time, it is encouraging to know, that to the several courses of instruction no fewer than fifty-six entries of students have been made, and that much diligence, intelligence, and improvement have been evinced by many of the students, and that several are very anxious again to avail themselves of these advantages.

The Council hope the Members will now avail themselves of the excellent arrangements at the Botanic Gardens for the cultivation of medicinal plants, which have been carried out with much skill and judgment by Mr. Shepherd, the Curator, who is taking every pains to make the collection as complete as possible. The Council refer with much pleasure to the *Conversazione* held in January last, which they have reason to believe gave satisfaction to all present; the expenses were nearly defrayed by the sale of tickets, and the small balance was paid by the Members of Council, so that its accounts were kept quite distinct from the general fund of the Society.

The Council have to acknowledge the following donations to the Library and Museum during the past year, and to record the Society's obligations to the donors:

Translation of Ph. Dublin, presented by Mr. Rawle; Ph. Lond., 1824, T. D. Walker; Rennie's Universal Pharmacopœia, 2 vols., Houlton's Formulary, Dr. Muspratt's Qualitative Analysis, Mr. Mercer; the Flora of Liverpool, Dr. Dickenson; Proceedings of the Literary and Philosophical Society of Liverpool, vol. vi., the Society; a very valuable collection of samples of Isinglass, Mr. H. S. Evans; a Bust of Sir Robert Kane, Mr. Cahill.

The Council regret that the expenditure of the year has somewhat exceeded the amount received; this will probably not occur another year, as the Laboratory expenses will in future be but trifling; they beg, however, to urge upon the Members the necessity of the prepayment of the subscription, which alone can enable them to expend the funds of the Society to the best advantage.

not caused by the presence of phosphorous in the luminous matter, and that a similar inference may be drawn with reference to the phenomena of vital phosphorescence generally. The author hazards an opinion, unsupported, however, by direct evidence, that the phenomena in question are due to the existence, in the luminous matter, of carbon in a different allotropic condition from any now recognized. This view, he states, accords, in some respects, although not entirely, with that entertained by Matteucci, who attributes animal phosphorescence to the slow combustion in air of a substance, *sui generis*, principally composed of carbon, hydrogen, oxygen, and nitrogen.

ANALYSIS OF A MINERAL CONTAINING GOLD, FROM THE PROVINCE OF COQUIMBO, CHILI.

BY F. FIELD.

The mineral described is similar to various classes of grey antimonious-copper, found in many parts of Chile. It was found on analysis to contain in 100 parts:—

Gold	0.003
Silver	0.075
Copper.....	36.720
Iron.....	1.232
Zinc.....	7.260
Antimony	20.284
Arsenic	3.912
Sulphur	30.350
	99.836

DESCRIPTION OF LAPIS LAZULI, FOUND IN LARGE QUANTITIES IN THE CORDILLERAS OF THE ANDES.

BY F. FIELD.

Immense masses of a bright blue rock having been found by a miner, it was at first supposed to consist of carbonate of copper. Analysis, however, proved that it contained no copper, but was a true lapis lazuli. It was interspersed with small veins of pure carbonate of lime. Analysis gave in 100 parts:—

Silicia	37.60
Alumina	11.21
Sulphur.....	1.65
Iron	0.08
Magnesia	0.36
Soda	9.66
Carbonic acid	15.05
Lime	24.10
	99.71

ON THE SPONTANEOUS DECOMPOSITION OF GUN-COTTON, AND ITS CONGENERS.

BY J. H. GLADSTONE, M.D.

The author having had occasion some time ago to prepare a variety of samples of the different substances produced by the action of nitric acid on woody fibre, starch, sugar, gum, &c., and having found that several of the samples, after being kept for some time, had undergone either partial or complete decomposition, describes the phenomena which were observed in each instance. From the observations recorded the following general conclusion is drawn, with reference to the spontaneous decomposition of gun cotton and its congeners:—that substances of this character have a tendency to suffer alteration in process of time from half the oxygen of the peroxide of nitrogen, NO_2 , they contain, separating from the remaining NO_2 , which escapes as nitric oxide gas, and combining with the organic substance, so as to form non-azo-tized acids, oxidizing at the same time a portion of the hydrogen, and causing it to be given off as water.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE SODA-PYROPHOSPHATE OF IRON.

BY ALEXANDER URE, ESQ.,
Surgeon to St. Mary's Hospital.

My attention was attracted some time back by an ingenious paper of Mons. Persoz on the double pyrophosphoric salts, published in the *Annales der Chemie und Pharmacie* for 1848. In the latter part of that paper, the author expresses an opinion that the pyrophosphoric salts are likely to prove of importance as medicinal agents. It is well known that iron is rendered very eligible for internal use, if administered in the form of a triple salt, as when combined, for example, with tartaric acid and potash; because the iron then is no longer precipitable by the alkaline hydrate. It would appear, however, that the soda pyrophosphate of iron is in many respects superior as a medicine to the triple salts into which the vegetable acids enter. Thus, the pyrophosphoric salt, from being saturated with oxygen, cannot in passing through the system absorb more, whereas, the latter salts under like circumstances, are constantly undergoing a process of combustion, according to Millon; and by withdrawing oxygen in this manner, must necessarily impair the efficacy of the oxide of iron as an oxydizing agent. It deserves notice, moreover, that the constituent ingredients of the soda-pyrophosphate of iron are to be found in the organism.

I have prescribed this salt to various patients, and found it act as a mild but efficient chalybeate. One little scrofulous girl, now under my care in St. Mary's Hospital, for disease of the hip-joint, has taken it in solution during several months with the best effect. The remedy was accurately prepared by Mr. Blyth, dispenser to the hospital, according to the subjoined directions of Mons. Persoz: 32.5 grammes of green sulphate of iron in crystals are to be mixed in a porcelain capsule with 5 grammes of sulphuric acid, 30 grammes of water, and as much nitro-muriatic acid as will suffice to effect the oxidation of the protoxide of iron. The above mixture is to be evaporated to dryness in order to get rid of the free acid, and then treated with water to the amount of one litre. From 107 to 110 grammes of crystallized pyrophosphate of soda are to be dissolved likewise in a litre of water, of course in a separate vessel. The two solutions are next to be mixed together, and provided the iron solution have been rightly prepared there will be no precipitate whatever.

Each litre of liquid will contain as much iron as 16.5 of the green sulphate.

This solution is not affected by dilution with rain or distilled water, but from being faintly alkaline, is rendered slightly turbid on the addition of water impregnated with lime.

ADDITIONAL INFORMATION ON THE MODE OF PREPARING THE BALSAM OF SONSONATE, COMMONLY CALLED THE BALSAM OF PERU.

BY JONATHAN PEREIRA, M.D., F.R.S.,
Physician to the London Hospital.

I AM indebted to my friend, Mr. G. U. Skinner, for the following additional information respecting the mode of preparing the so-called Balsam of Peru. It is written by M. Victor Le Nouvel, who has been engaged in collecting the balsam since 1836, and has had more of this substance passed through his hands than probably any other person. This account confirms those already published, but goes more into detail:—

"METHOD EMPLOYED BY THE INDIANS OF CENTRAL AMERICA FOR EXTRACTING THE BALSAM FROM THE BALSAM TREE.

"To extract the balsam from the tree the Indians begin by making an incision from five to six centimetres [about two to two and one-third inches] broad

and from nine to ten [about three and a half to four inches] in length (the *ventanita*, or little window), they then raise the bark from the living wood, and afterwards apply there pieces of cotton rags, after having heated the tree by surrounding it with a brisk fire for a short time. When they tap the tree for the first time they make the incision at about a metre [rather more than a yard] above the ground, and when the liquor ceases to ooze out they make a second incision by the side of the first one, and in the same manner, but a little higher up; and thus they continue making new incisions, as fast as they become exhausted, around the tree. In the course of ten or twelve days the rags become thoroughly impregnated with a thick olive-brown liquid: they are then withdrawn and subjected to a fresh process. The rags impregnated with the balsam are collected together and placed in an earthen vessel (called *olla* or pot) with some water, and boiled for five or six hours. During this operation the balsam detaches itself, and so long as the boiling continues mixes with the water, but as soon as the liquid becomes cold, the balsam being much heavier settles, and the water floats over it, and thus it is easy to separate them from each other. Before the water cools the cotton rags are removed; but as they still contain a certain quantity of liquid they are subjected to a more forcible pressure by means of a small machine, made with pieces of wood, cords, and tourniquets. Lastly, they collect all the balsam extracted from these rags, after subjecting them to pressure for several days, pour off the water, and put the balsam, which has now become dark and liquid, into a calabash, called *tecomate*, for the purpose of carrying it to market. The balsam which flows from the tree always contains a considerable quantity of water, and hence the necessity of boiling this liquor after it has been extracted.

"It is a fact that I have sometimes bought balsam which, after ebullition for three or four hours, has given out from fifty-five to sixty parts of water. The harvest lasts all the year, but more especially from November to May, because during the other months the rains are so abundant that they wash away the rags. The Indians study the phases of the moon, but I am not aware whether they choose the increase or decrease of this luminary."

ON RADIX UNCOMOCOMO (*Aspidium athamanticum*, Kunze), A NEW REMEDY FOR TAPE-WORM, FROM SOUTH AFRICA.

BY DR. THEODOR MARTIUS,
Professor in the University of Erlangen.

IN May last, at the general meeting, in Hamburg, of Apothecaries, Mr. J. C. E. Raabe (*Archiv d. Pharmacie*, Juli, 1851), exhibited the root, or more properly speaking, the cormus, of a fern, the origin of which was unknown. It was, however stated, that the natives of Port Natal and of the Cape of Good Hope used it as a remedy against tape-worm; and that in doses of half an ounce it operated safely and certainly. The native name for it was said to be *uncomocomo*. I also have received specimens of a cormus, which is undoubtedly identical with the one exhibited at Hamburg. The mother-plant is the *Aspidium athamanticum* of Kunze. At page 30 of Dr. Pappe's *Prodromus Floræ Capensis Medicæ*, is the following notice of it:—

"*ASPIDIUM ATHAMANTICUM*, Kunze. Stipe erect, flexuose, covered at base with long linear deciduous scales. Fronds leathery, smooth, lanceolate, three-pinnate. Pinnæ stalked, oblong, acuminate. Primary pinnules sessile, ovato-oblong, wedge-shaped at base, decurrent; secondary, sickle-shaped, oblong, blunt, veiny. Sori round, solitary. Involucre kidney-shaped.

"A fern, growing on grassy hills and in moist places near Port Natal. The Zoolu Caffres, who know it by the name of *Uncomocomo*, use it as a vermifuge, and its caudex, given in the form of powder, infusion or electuary, has been proved to be excellent in helminthiasis, and especially in the cure of the tape-worm."

I may add, that a few days before my departure from Erlangen, Dr. Bley, of Bemburg, informed me that he had made an analysis of this remedy.

It will rejoice me much if this communication should induce some English Physician to undertake an examination of the real value of this root; and as Mr. Raabe, of Hamburg, has a considerable quantity of it, it may readily be procured from him for experimental purposes.

NOTICE OF SOME VEGETABLE AND ANIMAL SUBSTANCES, NATURAL PRODUCTS OF NEW GRANADA.

BY M. J. RAF. MONZON, M.D.

(In a Letter to Dr. Pereira).

Sandi is a resinous gummy substance, produced in abundance by a tree known by this name, on making an incision in its bark. At first it presents itself white, or liquid like milk, and it is called in the province of Barbacoas, "milk of sandi." In a few days it acquires the consistency of resinous gum. In this state it is applied to various medicinal uses in different parts of New Granada, especially in the province of Barbacoas, a warm and damp country near the Ecuador, from where the present sample comes. Its principal therapeutic property is *resolutive*; applied as a plaster upon lupus, fleshy excrescences of the skin, cold and indolent tumours, &c., it produces their resolution; and this result is frequently confirmed by the inhabitants of those countries. I have obtained it almost always that I have made use of the milk in similar cases. At present my father has applied this gum in the valley of Cauca, and with extraordinary success, for the cure of "bocios," or obstructions of the thyroid gland. He has been able to purify it, taking away the part of potass which it contains in its original state, and has been able to give it the consistence and colour of gum Arabic; with this substance he makes a plaster, which destroys the "bocios" which so much abound in New Granada; and its general benefits are felt and acknowledged.

It is likewise used as an agent against sterility in women, applying it as a plaster upon the hypogastric region. In ulcers of a good character I have obtained frequent and quick cicatrization by applying it in the same manner; I have also used it as a vehicle for preparing and applying blisters.

Aceite de palo (oil of wood) is produced by a tree called "manteco," in the same province. Its principal therapeutic qualities are topical and blistering. By using it as an embrocation I have destroyed the epidermis, and have thus been able to get rid of freckles and superficial stains on the face and other parts of the body. Applied in larger quantities it produces the effect of a strong blister, excoriating and inflaming the skin. This oil is used in its natural state as an ointment, on arms and instruments of steel: it destroys their temper and softens them. By decoction it loses these qualities, and might be used as an ointment without any risk. It cannot be used as a lamp-oil, because it exhales a very thick smoke and the most disagreeable smell. It has no known internal medicinal qualities; it may be classed amongst the corrosive poisons; its colour is purple, its taste *sui generis*.

Leche de Popa (milk of the cow-tree).—This substance, in its natural state possesses the physical properties of animal milk. It is obtained by incision in the bark of the tree, which is very abundant in the province of Barbacoas. The Indians and the African race take it instead of cow-milk; it is very nutritive, but has no known medicinal qualities. It is used also for whitewashing houses, combining it with earthy substances, because, being glutinous, it makes the whitewashing last longer, and prevents its staining or rubbing off.

Miel de abeja de Brea (honey of the pitch bee).—This honey is extracted from the hive of a bee, very different from the one known in Europe, and very much smaller. It is acid. Its medicinal qualities are for interior refrigeration. I have applied it externally for contusions and ecchymosis, caused by blows or falls,

and I have always obtained a good result. The pitch is a resinous substance, of a dark yellow colour, and constitutes the hive made by this bee. It has a peculiar taste and smell, is very combustible, and is used by the common people for torches. It is soluble in alcohol. I have applied it as a plaster for nervous rheumatic pains, and it has always relieved the pains and swellings.

Canedillo.—This is the name of a cane with a bitter and aromatic bark, and, in my opinion, it belongs to the family of Winter's bark. It has many therapeutic qualities; amongst others it has particularly attracted my attention as an antidote against the bite of snakes and of other venomous animals. I consider it the best and the safest of all the antidotes known. Put two ounces of this bark in a bottle of alcohol, allow it to macerate for three or four hours, to obtain a tincture. Use two parts of this mixture with common water; a wineglass every two hours until you allay the headache of the bitten person—an infallible consequence of the bite; cupping at the same time, and extracting the tooth, which often remains in the part, which is then to be washed and covered with lint wetted with the same tincture. By this simple method I have cured hundreds, without the loss of a single life. This antidote is now generally kept by all the owners of mines, as a certain cure for bites of snakes, in preference to other antidotes formerly used. It has this advantage over them, that it may be taken in any quantity without danger. It is, besides, a tonic and anti-spasmodic. I have used it also as a febrifuge; in rheumatism (by friction); and in the windy colic, taken in the same way as for bites by snakes. For indigestion caused by weakness, and for amenorrhœa, from the same cause, it is also used.

Sandalo.—This is the bark of a tree which grows in the province of Esmeraldas, in the republic of the Ecuador. When burned it produces a balsamic smell; by boiling the bark when fresh it produces a very aromatic balsam, which, like the balsam of tolu is used in catarrh, spasmodic cough, ulcers, &c.

Note.—All these substances are indigenous in the province of Barbacoas. Popa and sandi are found in great abundance. Manteca de palo (oil, or literally butter of wood) is obtained only from young trees which grow in the plains.

GREAT EXHIBITION OF THE WORKS OF INDUSTRY OF ALL NATIONS.

(Concluded from page 228.)

FRANCE.

VICTOR BATAILLE, *Blangy-sur-Brest*.

Pyroligneous and other acids, and chemicals principally for dyeing and printing.

BOYER & Co., 33, *Rue de la Harpe, Paris*.

Albumen of blood, called *albuminous serum*. This albumen, which is patented in France, is in powder, and is intended as a substitute for the white of eggs, in all its applications. Being dried at a temperature below that at which it coagulates it is soluble in cold water.

DE CAVAILLON, 30, *Rue Tailbout, Paris*.

Chemical products obtained by purifying gas used for lighting.

DROUIN and BROSSIER, *Labriche, near St. Denis*.

Bichloride of tin. Stannate of soda. Red prussiate of potash. Caustic potash. Extracts containing the colouring matter of different woods used for dyeing.

P. F. FLEURY, *Teste de Buch, near Bordeaux*.

Purified marine turpentine, produced by a new process for purifying the raw turpentine found in the wastes of Bourdeaux. It is manufactured at less than half the cost of the turpentines of Chio, Venice, Strasbourg, Sweden, and Boston.

LEHABY, 78, *Rue St. Lazare, Paris*.

Medicinal envelopes, or lichen capsules, for containing medicines and concealing their disagreeable flavour. They have been patented in France and England.

LEPERDRIEL, 28, *Rue des Martyrs, Paris*.

Pharmaceutical caouchouc for dressing blisters, issues, &c.

LEROUX, Vitry le Français.

Bark of the willow tree, and a large specimen of salicine, the bitter principle obtained from it.

MALAPERT, Poitiers.

Sulphate of magnesia, and sulphate of soda, made by new manufacturing processes.

C. H. SCHATENMAN, of Bourwiller Mines Joint Stock Company, Bourwiller.

Purified and common alum, sulphate of iron, prussiate of potash, Prussian blue, &c.

MOREAU, URBAIN, & Co., Montrouge.

A very interesting series of products obtained from bituminous schist. They consist of lamp-oils, essence for making varnishes, oil for machinery, soaps, and pastes for the toilet, &c.

LEFEBVRE & Co., Moulins, Lille.

White lead. Zinc white.

KUHLMANN, BROTHERS, Lille.

Sulphate of alumina, in flat cakes. Sulphite of soda.

P. H. AUBERGIER, Clermont Ferrand.

Specimens of French opium and syrup of lactucarium.

M. A. C. COLLAS, 8, Rue Dauphine, Paris.

Chemical products obtained from the distillation of coal, including artificial oil of bitter almonds, coloured and colourless. This is the nitrobenzoyl of chemists. Artificial essence of pine-apple. Digitaline, and other preparations.

BOBEE and LEMIRE, Choisy-le-Roi.

Chemical products, including acetic acid, acetone, pyroxylic spirit, &c., which appeared good.

W. CONRAD, 6, Rue Vielle de Temple, Paris.

Refined camphor, in nearly flat cakes, and different in this respect from those made in this country. Sublimed iodine. Iodide of potassium, in large cubical crystals, &c.

FOUCHÉ LE PELLETIER, Javel, near Paris.

Binarsenate of potash, (good). Sulphuret of potassium (good). Binoxalate of potash, in very large crystals. Oil of vitriol and model of a new apparatus for its manufacture, by which economy is effected. Other chemicals.

On the whole, although there were some good specimens, yet the chemical manufactures of France were not well represented in the Exhibition. The number of exhibitors was comparatively small, many of the manufacturing chemists well-known in France not having contributed.

ALGIERS.

A few articles, pharmaceutically interesting, were exhibited from this district.

J. B. FRÉDÉRIC, Montpensier.

A sample of opium. White poppy capsules, of the crop 1850.

M. HARDY, Manager of the Hamma Nursery, near Algiers.

Cochineal, opium, and oleogenous seeds.

In addition to the above, pickled olives, olive oil, saffron, and madder, were exhibited from Algiers.

SARDINIA.

Among the chemical and [pharmaceutical products from this country were some good specimens.

ALBANI, BROTHERS, Turin.

Gelatine from bones. Soda soap from the fat of bones. Sulphuric and nitric acids. Nitrate of barytes made from the sulphate of barytes of Savoy.

GIROD & Co., Aiguebelle.

Gallic acid, extracted from chestnut wood.

CALLOND, Annecy.

Phloridzine, from the bark of the pear-tree. A good specimen of Santonine, the febrifuge principle of *thu semen contra*. Morphia, extracted from poppies grown in Savoy. Beberine.

L. DUFOUR, Genoa.

Citrate of quinine, and a fine specimen of sulphate of quinine.

J. BONJEAN, *Chambery*.

Pure ergotine in phials, with a small model of an apparatus for the preparation of this product.

UNITED STATES.

The only specimens in this department of the Exhibition that we have to notice are those of

HASKELL, MERRICK, AND BURL, *of New York*.

Samples of powdered drugs.

T. J. HUSBAND, *Philadelphia*.

Calcined magnesia, which is said to be free from unpleasant taste, roughness, or grittiness.

POWERS and WRIGHTMAN, *Philadelphia*.

A great variety of chemical compounds used in medicine, both organic and inorganic. The collection contained many rare alkaloids and their salts, and was altogether such as to do justice to the high character of the house by which they were exhibited, which ranks among the first of the chemical manufacturing houses in the United States. Several specimens from this collection have been presented to the Museum of the Pharmaceutical Society.

[We received a copy of the following paper from Dr. Muspratt a few weeks back, but deferred its publication, having heard that another paper or papers were about to be published on the same subject, and thinking it better that all should appear together.—Ed.]

ON THE COMBINATION OF ARSENIOS ACID AND ALBUMEN,

With Remarks on Liebig's Theory.

BY DR. SHERIDAN MUSPRATT, F.R.S.E., F.C.S.L., &c.

From the *Chemical Society's Transactions*, July 1, 1851.

My time has been so much occupied the last year, that I have had no opportunity of investigating, thoroughly, the compound of arsenious acid and albumen. I have latterly, however, paid considerable attention to this subject, owing to the following absurd statement appearing in the *Transactions of the Chemical Society*:* "If water so readily extracts arsenious acid both from the compounds formed in the laboratory, and from those which nature has prepared, surely we may conclude that its retention is simply mechanical, and affords no ground for the theory which that eminent chemist, Liebig, has raised upon it."

Baron Liebig writes: "Arsenious acid enters into a very firm combination with membranes and gelatinous tissues; the arsenious acid combining with these, gives to them the power of resisting decay and putrefaction."

I cannot believe that so renowned a philosopher could have published such statements, unless he was convinced of their correctness from experiments and analysis. I now enter upon my researches.

QUALITATIVE ANALYSIS.

I took 0.107 grm. of dissolved arsenious acid and 12.67 grms. of the glairy albumen of eggs. They were intimately triturated together for about twenty minutes, coagulated by heat, and evaporated to dryness in a water-bath. The white residue, affused with cold distilled water and filtered, yielded a filtrate which gave no deposit of arsenic on copper by Reinsch's test, nor any stains on porcelain by Marsh's apparatus. When the residue on the filter was heated with pure sulphuric acid, and then submitted to the preceding experiments, arsenical indications were immediately obtained, proving that a combination of arsenious acid and albumen had occurred.

QUANTITATIVE ANALYSIS.

61.07 grms. of albumen were mixed as above with 0.603 grm. of dissolved arsenious acid. I washed the mixture, after evaporation to dryness, with boiling water, until not a trace of arsenious acid dissolved out.

The filtrate was introduced into a bottle provided with a glass stopper, some

* Chem. Sec. Qu., J. III, 16.

hydrochloric acid added, and a stream of sulphide of hydrogen passed through the menstrum. The flask was then closed, and allowed to rest for some hours; after this, pure carbonic acid was transmitted through its contents with the view of expelling all the free sulphide of hydrogen: the sulphide of arsenic was then collected on a tared filter, dried at 100° C., and weighed.

Weight of tersulphide of arsenic.....	0.270
Equal to, of arsenious acid	0.217

The above results, therefore, prove incontestably that the albumen had combined with 0.386 grm. of arsenious acid. This compound is not poisonous. I heard from Professor Gregory, that he performed some experiments in Dublin in 1857, which satisfied him that Liebig was right; and Sir Robert Kane has stated that the "compound of albumen with the acids is generally somewhat soluble; with metallic oxides insoluble."^{*}

When the white of egg is used as the antidote to metallic poisons, it acts no doubt mechanically as well as chemically—a large portion being enveloped and protecting the mucus membrane of the stomach, while a small portion enters into combination.

In the qualitative analysis a portion of the arsenic was in mechanical combination.

The analytical results cited are to my mind so convincing, that to descant further upon the matter would be superfluous; and I may close this notice with the following able remarks of Dr. Anderson, of Edinburgh, with which I entirely coincide.

"There is in my opinion no doubt that the metallic poisons are capable of uniting with animal matters; and this I apprehend is perfectly well known to all toxicologists, and is the universally received explanation of their antiseptic properties."

College of Chemistry, Liverpool, 1851.

• ON THE COMBINATION OF ARSENIOS ACID WITH ALBUMEN.

BY THORNTON J. HERAPATH, ESQ.†

Nor a little controversy has recently occurred amongst chemists with regard to the nature of the combination which is stated to take place between arsenious acid and albumen. According to Prof. Liebig‡, these two bodies combine in atomic proportions, and it is owing, he says, to this circumstance that the vitality of the organs is destroyed in cases of arsenical poisoning. The same opinion, it seems, is entertained by Dr. Sheridan Muspratt, of Liverpool, who has lately published some results§ which certainly appear to establish the truth of the hypothesis. Other chemists, on the contrary, say that this statement of Liebig's is founded on error—that arsenious acid does not, under any circumstances, form a true chemical combination with albumen, and is only separated by the latter substance from its solutions by a species of mechanical action; that is to say, somewhat in the same manner, perhaps, as iodine and many vegeto-alkaloids are well known to be absorbed and extracted from their solutions by animal charcoal. In evidence, they adduce the results of Mr. Edwards's experiments, an account of which was published some few months back in the Transactions of the Chemical Society of London||. According to this latter experimentalist, the whole of the arsenious acid may be readily extracted from the compound by means of boiling water, provided the operator takes care "thoroughly to break up the mechanical network of the coagulate" (I adopt his own expression) by trituration with a pestle and mortar.

A short time ago, my attention was drawn to the subject by my father, Prof. W. Herapath, who desired me to repeat the experiments above referred to, with the view if possible, of deciding the question, as it was one which he considered of much interest, in consequence of its bearings upon Toxicology. I accordingly did so. My results may be summed up as follows:

Experiment 1.—499 grains of the glairy albumen of eggs were taken and intimately mixed, by long-continued trituration, with 30 grs. of arsenious acid; the latter having been previously dissolved in a quantity of water sufficient to effect a perfect solution. The mixture was then coagulated by heat, and afterwards carefully evapo-

* Chemistry of Agriculture and Physiology, p. 377.

† Communicated by the Author.

‡ Organic Chemistry, part ii., chap. xiv., p. 358.

§ Quart. Journ. of the Chem. Soc. of London, No. xiv. p. 178.

|| Ibid. No. ix. p. 14.

rated to dryness in a water-bath. The yellowish residue thus obtained was reduced to a very fine powder in a mortar, and repeatedly digested, for several hours together in boiling water; care being taken to reduce the compound to a still more minute state of division, by patient trituration in a mortar after each digestion, &c. The washings, on being tested by Reinsch's process, was found to contain a large proportion of arsenious acid.

The insoluble residue having been digested in water for about twelve or fifteen hours, as before described, was dried and weighed. It amounted to about 29 grs. || It was then boiled in strong hydrochloric acid, when it dissolved with the characteristic colour of the proteine compounds. Upon testing this solution in the usual manner, only exceedingly minute traces of arsenic could be detected; a quantity insufficient to yield, on oxidation, a perceptible sublimate of arsenious acid.

Experiment II.—According to the authorities above referred to, 61.07 grms. of albumen will combine with 0.386 grm. of arsenious acid = 0.632 per cent. If this statement be correct, I argued, of course if I make a mixture of these two substances, so arranging my experiment that the arsenious acid shall not be present in such large quantity, or in other words, if I employ an excess of albumen, and evaporate the compound to dryness, no trace of arsenious acid ought to be extracted from the mass upon subsequent digestion in boiling water. 438.5 grs. of glairy albumen were therefore mixed with an aqueous solution of arsenious acid, containing 0.25 gr. of AsO_2 . The mixture was evaporated to dryness in a gas-oven, and the brittle residue thus obtained treated as in the preceding experiment. The washings, when tested by Reinsch's process, gave evident tokens of the presence of a large quantity of arsenic. The insoluble residue, however, when decomposed in the usual manner by sulphuric acid and heat, and afterwards introduced into Marsh's apparatus, gave but very faint stains of metallic arsenic.

Experiments III, IV, and V.—The same experiments repeated, different proportions of arsenious acid and albumen only being employed. Similar results were obtained.

Experiment VI.—Experiment II. repeated, the same quantities of arsenious acid and albumen being used. Instead of evaporating the mixture to dryness however as before, it was merely heated to the boiling-point and then filtered, in order to separate the coagulum which was formed. This latter was then divided into two portions; one of these was treated by Reinsch's process, and found to contain sensible quantities of arsenic, as did also the liquid from which the coagulate had been separated, in either case bright steel-gray stains being formed upon the copper; the other half, on the contrary, was triturated for several minutes in a mortar with about twice its weight of pure quartzose sand, afterwards boiled in water, and treated as in the former experiments. Upon subsequently testing it by Reinsch's process, only very faint and doubtful traces of arsenic were discovered.

Experiment VII.—483 grs. of albumen were mixed with 3.0 grs. of dissolved arsenious acid. The mixture was then coagulated by heat and treated as before. The washings having been carefully collected and evaporated to dryness left a yellowish residue, which was redissolved in boiling water. The latter solution was filtered, in order to remove some few flocculi of albumen which had passed through the pores of the muslin strainer; it was then acidulated with hydrochloric acid, and treated with sulphuretted hydrogen, a stream of which was passed through it for some time, until the liquid smelt strongly of the gas. The solution was boiled in order to dispel the excess of hydrosulphuric acid, and the precipitate of tersulphide of arsenic formed separated by filtration. When dried at 212°F . it was found to weigh 3.63 grs. = 2.921 grs. AsO_2 .

Experiment VIII.—This was undertaken with the view of ascertaining whether arsenious acid really loses its poisonous properties on admixture with albumen, as has been asserted.

The whites of three eggs, weighing altogether 1624 grs., were mixed with water and 6.5 grs. of dissolved arsenious acid. The mixture, having been evaporated to dryness, was finally comminuted, mixed with food, and administered to a cat. Having eaten about a fifth or a quarter of the powder, the animal refused to take the remainder; in a short time it exhibited considerable uneasiness, vomited repeatedly, and was soon afterwards attacked with all the symptoms of arsenical poisoning. It lingered on, however, in a state of extreme torment, for two or three days, and then

|| It must be understood, however, that this quantity does not represent the whole of the albumen contained in the white of egg employed: a portion was undoubtedly lost during the long-continued washing.

died, refusing food to the last. No *post-mortem* examination of the body was made ; my time being then much occupied with other matters of importance.

As regards the above results, it is my opinion quite unnecessary to offer any observations upon them, as they may be said to speak for themselves. I shall therefore content myself with relating the facts I have observed, and leave my readers to draw their own conclusions.

Mansion House, Old Park, Bristol, May 16th, 1851.

MODIFICATION OF THE MINIM-METER.

BY MR. JOHN ABRAHAM.

In your last number, at page 222, you have described a modification of Alsop's Minim-Meter, introduced by Mr. Ashton. I have for several years had in use one contrived by myself, which I consider much superior to either. It is shortly referred to in the *Pharm. Journal*, vol ix., page 170 ; but as probably you are unacquainted with it, I herewith send you one. For the piston in Alsop's and in Ashton's, I substitute an elastic bottle, secured to the top of the graduated tube. The instrument never gets out of order, and is readily managed with one hand, which is not the case with Alsop's, nor, I should think, with Ashton's. It is used with such facility, that I have always found it preferred to all others by dispensers, for dispatch and convenience, and independently of its greater accuracy. It should be kept in a deep bottle of water, the point not reaching the bottom, which serves to keep it always clean and ready for use.

78, Bold Street, Liverpool,
14th November, 1851.

FACTS RELATING TO THE HISTORY OF MANGANESE.

BY M. J. LEFORT.

THE combinations formed by the sesqui-oxide and bin-oxide of manganese are, up to the present time, almost unknown. Perhaps this omission may be attributed to the difficulty of the preparation of these oxides in a state of great purity, and in sufficient quantity.

The separation of manganese from those metals which (as is the case with iron) are closely allied to it, is of considerable difficulty.

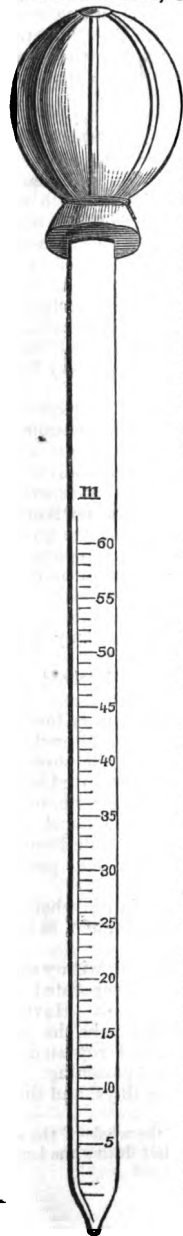
The purport of this notice is to describe a quick and yet certain method which I employ, in order to obtain manganese in a state of absolute purity.

This process is based on the property possessed by the hypochlorites of raising the protosalts of manganese to a higher state of oxydation. M. Millon, as is known, was the first who pointed out this reaction as useful in detecting the presence of hypochlorous acid in chlorine water.

The protochloride of manganese resulting from the preparation of chlorine, or the protosulphate, obtained by the calcination of peroxide of manganese with sulphate of iron, is to be dissolved in a certain quantity of distilled water, and submitted to a temperature of from 86° to 104° Fahr.

To this liquor there is then added chloride of soda or of potash, containing a small quantity of carbonate of soda or of potash, until the precipitate which is formed no longer changes colour.

When the whole of the protosalt of manganese appears to be proxidized, the liquor is to be decanted, and the precipitate washed with water acidulated with nitric acid ; one part of acid, in fifty parts of water, is sufficient to dissolve all those metals which are naturally contained in the manganese of commerce.



The oxide obtained by this method is a dark brown powder, anhydrous, but retaining from one to three per cent, of interposed water. When this operation has been properly conducted, the whole of the manganese will have passed into the state of a very pure binoxide. Considered in an industrial point of view, the process I have now described, may be of some utility; I allude to the revivification of the manganese contained in the residues which have been used in the preparation of decolourizing hypochlorites and disinfectants.

It is known that M. Ebelmen (Payen, *Chimie Industrielle*, p. 186, 1849) proposed to render these residues available, by saturating them with an equivalent of hydrate of lime, and allowing them to deposit. The liquid containing the chloride of calcium is then decanted, and the deposit washed and kept humid, absorbs by degrees the oxygen of the air, and passes into a state of oxidation intermediate between the protoxide and the sesquioxide of manganese.

I would recommend the addition of a certain quantity of chloride of lime to the hydrate of lime, which would in course of a few hours, cause the manganese to pass into the state of binoxide.

The cost occasioned by the addition of the chloride of lime, the value of which is but small, would be to a great extent compensated for by the saving of time, and by the chlorine produced.—*Journal de Pharmacie*.

[The account of the cultivation of opium in our last number, was compiled from the best sources within our reach, and illustrated by drawings in the Great Exhibition. We have subsequently been favoured by Dr. R. D. Thomson of Glasgow, with a copy of an official report, which contains much additional matter, including interesting statistics and chemical analyses. We consider this information so valuable, that we intend to publish the entire paper, of which the first portion is subjoined.—Ed.]

SELECTIONS FROM THE RECORDS OF THE BENGAL GOVERNMENT, ON THE SYSTEM OF CULTIVATING THE POPPY AND OF PREPARING OPIUM IN THE BENARES OPIUM AGENCY ;

With a Brief Sketch of the Constitution of the Department.

BY W. C. B. EATWELL, M.D.

THE cultivation of the poppy in British India is confined to the large central Gangetic tract, about six hundred miles in length, and two hundred miles in depth, which is bounded on the north by Goruckpore, on the south by Hazareebaugh, on the east by Dinpore, and on the west by Agra.

This large extent of country is divided into two agencies, the Behar and the Benares, the former being presided over by an Agent stationed at Patna, at which station is the central or sudder factory of the agency, the latter being under the controul of an agent residing at Ghazee-pore, which station contains the sudder factory of the Benares agency. Finally, the controul of the entire department is vested in the Board of Customs, Salt, and Opium, located in Calcutta. Of the two agencies, the Behar is the larger and more important, sending to the market about treble the quantity of drug turned out by the Benares agency.

The Benares agency comprises eight divisions, namely, the Benares and Mirzapore, the Ghazee-pore, the Azimghur, the Juanpore, the Selimpore, the Goruckpore, the Cawnpore, and the Futtehpore. In these eight divisions, the aggregate amount of land under Poppy cultivation in the season 1849-50, was 1,07,823 beegahs*.

Each division is under the management of a sub-deputy opium agent, who resides at a central factory, at which the yearly produce of his division is collected, and, whence it is forwarded to the Sudder factory at Ghazee-pore.

In addition to these officers, the collectors of all the districts in which sub-deputy Agents are stationed, are Ex-officio Deputy Opium Agents, and each exercises a general controul over the sub-deputy agent stationed in his district. All correspondence between the agent and the sub-deputy agent passes through the hands of the deputy opium agent; he is answerable that no monies on account of expenses for the department are placed at the disposal of the sub-deputy opium agent, without

* A beegah is 27,225 square feet.

the previous sanction of the agent ; he is charged with the investigation of all suits which may arise out of matters connected with the department, and whilst it is his duty to uphold in every proper way the authority of the sub-deputy agent, it is likewise incumbent upon him to be ever alive to the welfare and interests of the cultivators, and to see that no undue influence is used to induce them to cultivate contrary to their wishes. In the divisions in which there are no deputy opium agents, the above controul is exerted by the agent in person. However, although the above-mentioned control over the proceedings of the sub-deputy opium agent exists, the actual management of the affairs of his district is nevertheless entirely in his own hands. As it would be, however, impossible for him to exert personal supervision over the whole of the details of the business of his division, he has under him a number of responsible executive native officers called gomashas, who are entrusted with special and important duties, the nature of which shall be described shortly.

Each division is separated into a certain number of sub-divisions, called kotee illaquas, each being of such extent that a single responsible officer can exert an efficient controul over all the operations conducted in it, and each of these kotee illaquas is under the immediate management of a gomasha. The gomasha has his head-quarters at the kotee, which is a building having some central situation, and in it he has his treasury under the custody of a tehvildar or treasurer, and an establishment sufficient to enable him duly to keep and render the accounts of his illaqua to the sub-deputy agent.

The sub-deputy agent having concluded his agreements with the cultivators, it is the gomasha's duty to measure their lands, and to ascertain that they are equal in extent to the area which each has agreed to cultivate, and the correctness of the gomasha's measurements is again tested by the sub-deputy agent in person, who moves through his district during the cold season, and makes test measurements of certain portions of his cultivation. The gomasha's further duty is to pay to the cultivators of his illaqua their advances, which he receives from the sub-deputy agent, and finally he receives and weighs their produce, for the safe delivery of which at the sudder factory at Ghazepore he is held responsible. To assist the gomasha in his intercourse with and supervision of the cultivators, there are individuals employed called jemadars and zilladars, and it is the duty of these subordinates to overlook personally the cultivators, and to watch the various steps of the cultivation. In addition to the above native officials, there is in each division a trustworthy native officer called a mohotomim, who exerts a sort of general supervision of everything that is transacting in the division, making frequent reports to the agent or to the sub-deputy agent, as the case may be, of the progress of affairs in the district. It will be gleaned from what has been already stated, that the number of native officials employed in the Benares agency is very considerable. Of native officers of the first class the number amounts to nearly one hundred and fifty, whilst of subordinate officials and paid servants in constant employ, the number reaches very nearly to twelve hundred. In addition to this permanent establishment, there is during the manufacturing season a temporary establishment of upwards of six hundred individuals employed in the Ghazepore sudder factory alone, including three or four European assistants and some twelve or fifteen European and Christian boys.

The number of persons actually employed in cultivating the poppy in the agency is very great. The number of lumberdars who signed agreements to cultivate in 1849, 50, amounted to 21,549, and the total number of under cultivators was 106,147. When it is further taken into consideration that the families of these individuals take no inconsiderable share in the labours of the cultivation, and in the preparation of the drug, some idea may be formed of the vast number of human beings whose interests and welfare are bound up in the Benares agency alone.

Notwithstanding the extent of this large charge, all works smoothly and well, and the conduct of all officers is regulated by fixed rules emanating from the agent, or from the opium board.

Such, then, is a very slight outline of the constitution of the agency, and of the means and checks instituted to ensure the discharge of the duties of the department with fidelity to the government and with equity to the cultivators.

It is a strict rule in the agency that it shall be entirely optional with every person, either to enter into agreement to cultivate the poppy at such prices as may be fixed for the produce by the government, or to decline the cultivation altogether.

The agreement to cultivate is made by the sub-deputy agent, with a lumberdar,

an individual who has a variable number of cultivators under him, and for whom he acts as accredited agent. After the agreement to cultivate has been made, the lumberdar receives a printed form written in Hindee, called a hath chittee, in which the stipulations of his contract and the penalties attached to the infringement of its provisions are clearly set forth. In the hath chittees are, moreover, entered the names of the lumberdar and of his under cultivators, the quantity of land which each agrees to cultivate, the actual measurement of the same as tested by the gomashita, the acknowledgments of all sums of money received, the weight and consistence of all opium delivered, and its value. The hath chittee, is in fact, a record and voucher of every transaction between the lumberdar or his sub-cultivators, and the sub-deputy agent or gomashita from the time of making the agreement until the final payment for the produce and adjustment of the accounts. As it is a rule in the agency that the final settlement with the cultivators shall be made by the sub-deputy agent in person, the hath chittee enables the adjustment to be made at once, by presenting in a compact form an attested record of all the transactions which may have taken place between the gomashita and the cultivators. In order to enable the cultivator to carry on his agricultural operations, he receives from time to time certain advances, the amount of which reaches in the aggregate to about one-half of the value of the estimated out-turn of produce. If the land have been under cultivation in previous seasons, its average produce is known; if it be new land, and considered by the sub-deputy agent as eligible, then the cultivator, in addition to the usual advances, receives in addition an extra advance of so much per beegah to enable him to bestow a certain amount of extra care in tilling and dressing the soil. The first advance is made on the completion of the agreement or bundobust, and this takes place in September and October. The second advance is made on the completion of the sowings in November, and the final, or chooktee payment, is made immediately after the delivery and weighment of the produce. Nothing, therefore, can be fairer to the cultivator than this system of advances; he is subjected to no sort of exaction, in the shape of interest or commission on the money which he receives, and it puts within his power the certain means of making a fair profit by the exercise of common care and honesty. It is an established rule in the agency that the cultivator's accounts of one season shall be definitively settled before the commencement of the next, and that no outstanding balances shall remain over. When a cultivator has from fraud neglected to bring produce to cover his advances, the balances due by him are at once recovered, if necessary, by legal means; whereas, if he can satisfactorily show that he has become a defaulter from calamity and uncontrollable circumstances, and that the liquidation of his debt is placed entirely beyond his power, his case is then made the subject of report to the government by the agent, with the request that the debt may be written off to profit and loss. These provisions are most wise, for outstanding balances may be made a powerful means of oppression, and to their operation may be traced a considerable amount of litigation, and agrarian crime in the indigo districts of lower Bengal. It is clear that when such balances become so large that the cultivator cannot discharge them, he is no longer a free agent, but is perfectly subservient to the will of his creditor, for whom he must cultivate whether he desire it or not. Such burdens may even be handed down from father to son. The fairness of the agency system, and the justice with which the cultivators are treated, are best evidenced by the readiness with which they come forward to cultivate, and also by the comparative rarity of agrarian crime, arising out of matters connected with the poppy cultivation.

(To be continued.)

OBSERVATIONS ON THE SASSY BARK OF WESTERN AFRICA, AND ON THE TREE PRODUCING IT.

BY WILLIAM PROCTER, JUN.

VARIOUS travellers, from the celebrated Mungo Park to the more recent explorers of Western and Central Africa, have alluded in their narratives to the use of a poisonous bark as an ordeal to which persons suspected of witchcraft, secret murder, and other crimes in the code of those countries, are subjected, as a test of their innocence or guilt. In Congo, it is known as the "ordeal bark," and in Ashantee and the neighbouring settlements of Liberia, as "doom bark," and the process of its

administration, as "taking doom." It is also said to be resorted to as a means of gratifying private revenge, an application to which its chemical nature readily admits, and its use, in the opinion of the missionaries, is a great moral evil worthy the attention of the philanthropic.

Moses Sheppard, Esq., of Baltimore—a gentleman whose interest in the welfare of the African race has, for many years past, connected him, as a patron, with the Colonization of Western Africa, at Liberia—several years since received from Dr. Samuel F. McGill, of Cape Palmas, a few pounds of *sassy* bark, a portion of which was given to Mr. Charles A. Santos, now of Norfolk, Va., who published an account of its physical, and some of its chemical properties, in this Journal, vol. xxi, p. 97*.

More recently, Mr. Sheppard placed in my hands about two pounds of the bark for examination, but feeling a reluctance to devote time and labour to the investigation of a product, the botanical source of which was unknown, that gentleman kindly offered to obtain for me, through his friend Dr. McGill, specimens of the leaves, flowers, and fruit of the sassy tree. About nine months ago, a box was received from Liberia, containing the leaves, fruit, twigs, wood and bark of the sassy tree, but the flowers, the most important part, were omitted, as the tree was then in fruit. As the flowers then promised have not yet arrived, I have concluded to publish what facts have been collected from travellers, together with those derived from an examination of the specimens.

The tree producing sassy bark has not been described in any of the botanical works in the library of the Academy of Natural Sciences of Philadelphia, including De Candolle, Lindley, and Endlicher, and in the narratives of travellers so little attention has been given to the means of identifying it, that the specimens themselves, imperfect as they are in the absence of the flowers, will afford more light than can be obtained from any other available source.

In Bounditch's *Ashantee*, page 279, the following paragraph is found :

"Taking doom is the infallible test, when they consider the case too doubtful for human decision. The bark of that tree, (viz: the "doom plant,") is put into a large calabash with water, so as to make a strong infusion; it is stirred up, while the suspected parties sip in turn. It operates instantly and convulsively as a most violent emetic and purge. Those who sip first may recover, and the dregs are frequently left designedly for the obnoxious."

In Tuckey's narrative of a voyage to the river Congo, page 185: "This morning Gangam Kiskey (the public accuser and executioner) returned, and we learned that he had denounced three men of another village as the poisoners of the man that died, and the accused were immediately to undergo the ordeal of chewing the poisonous bark, which, if they were guilty, they would retain in the stomach, and this would occasion death, but if innocent, they would vomit."

Ibid, page 200.—"It appears that the bark used in the ordeal is from a species of *Cassia*."

Ibid, page 329. "The bark and leaves of the Cassa tree, which Gangam Kiskey made use of as an ordeal, were brought to us. They are said to be poisonous."

Bruce, in his travels, (vol. v. p. 27, quarto edition,) describes a tree called "*sassa*," which yields the *sassa gum* of African commerce, and he gives two figures which represent the leaves and flowers. The tree is very analogous in general appearance to that of the sassy bark, flowering in a terminal raceme, with bipinnate leaves, the folioles of which, however, are opposite, whilst those of the sassy are alternate. This tree is the *Inga Sassa* of Willdenow. (De Candolle.)

In the Appendix to Tuckey's voyage, &c., it is stated that "One of the unpublished genera is *Erythrophleum*, the *red-water tree* of Sierra Leone, another species of which is the *ordeal plant* or *cassa* of the natives of Congo." This remark is more to the point than any that has been found; because, as Sierra Leone is near the locality whence the sassy bark is derived, and as there is strong reason for believing the *cassa* bark of Congo (why not *sassa* or *sassy* as a derivation or corruption?) and sassy bark to be identical, the former of which is attributed to a leguminous tree, said to be a species of *Erythrophleum*, (vid. ante) is it not reasonable to refer the sassy bark tree of Cape Palmas to the same genus, or at least to one nearly allied, and perhaps not yet described?

Lindley, in his last edition of the *Vegetable Kingdom*, places the genus *Erythrophleum* of Afzelius in the Natural Order *FABACEÆ*, sub-order *MIMOSEÆ*, and tribe *PARKIEÆ*.

* Mr. Santos calls it *saucy* bark. Sassy is the term used by Dr. McGill.

Endlicher, *Genera Plant*, page 1323, characterises the genus *Erythrophleum* of Afzelius thus:—"Flores hermaphroditi, regulares. Calyx quinquefidus subimbriatus. Corollæ petala 5. Stamina perigyna. Legumen compressum, bivalve, polypermum. Arbor, Africæ tropicæ, excelsa; foliis bipinnatis, foliolis oppositis; racemis terminalibus et lateralibus." This agrees with the specimens of sassy, as far as they go, except in the position of the folioles, which will now be described.

The sassy bark is produced by a large tree with spreading branches. In the general appearance of fructification and foliage it resembles the *Gymnocladus* of the United States. The leaves are bipinnate, the pinnæ are articulated oppositely on the general petiole, and vary from three to six or seven on a side, according as they are taken from near the terminus of a branch or below; in the last case they are larger, and generally the pinnæ nearest the apex are largest. The folioles are subpetiolate, obliquely ovate, and acuminate, from one to three inches long and from one to one and a half wide, alternate, smooth, entire, sometimes slightly repand, and varying from three to five or six on a side, one being terminal. The bark of the younger branches and twigs, which is dark gray, is covered with light coloured dots, which extend to the receptacles on the raceme.

The legume is from two to four inches long, and from one to two wide, violin shaped, of a dark chestnut colour, coriaceous, compressed, obtuse at both ends, bivalved, containing from two to five seeds attached by short funiculi, and dehisces by the dorsal suture. The legume contains considerable tannin. The seeds have an oblong oval, flattened form, are black except the hilum, which is brown, smooth and covered with a dry gummy transparent substance, analogous to cerasin, which is dissolved by boiling water, and forms a colourless solution, from which it is precipitated by subacetate of lead, sesqui-chloride of iron and alcohol.

The seed has a hard, horny episperm, and a tough, horny, light grey albumen, nearly surrounding the cotyledons, and composed of a bassorin-like substance, which swells in boiling water, and becomes translucent like tragacanth. The cotyledons are large, compressed, indurated, and yellowish green coloured. They have a disagreeable taste, contain chlorophylle and fixed oil, in small quantity, but no starch, nor has this principle been found in any part of the plant.

The tree must be large, as the section of a branch three inches in diameter exhibited the bark but one-sixteenth of an inch thick, grey-coloured, while the bark used for poisoning is from three to five-eighths of an inch thick. The young wood has a greyish white colour, and is not very dense.

Sassy bark is taken from the trunk and larger branches. The specimens last sent by Doctor McGill are from a younger tree than those first received. The former was in pieces from four to ten inches long, all more or less curved, and exhibiting the mark of the knife at the ends, with some indication of dried sap on the cut surface, and about four lines thick. The exterior is slightly fissured longitudinally, and has lichenoid matter attached. The older bark has the epidermis removed in most of the pieces, and has a dark brown ferruginous colour. The internal structure of the bark is quite peculiar. A smooth transverse section exhibits numerous round, fawn-coloured spots, surrounded by a reddish-brown cellular tissue. These spots are sections of cylindrical bodies, varying from one-half to two lines long, compact, brittle and very dense, sinking rapidly in water, and are most numerous in the oldest bark and near the inner surface. The spec. grav. of the bark in mass, according to Santos, is 1.054. Sassy bark has a slight not very marked odour, and an astringent taste, without bitterness. This astringency, which is due to tannic acid, resides exclusively in the reddish coloured portion, a fact easily shown by applying with a camel's hair brush, a dilute solution of sesqui-chloride of iron, to a transverse section. The fawn-coloured spots will remain intact while the surrounding tissue is dyed deep black. Sassy bark breaks with an abrupt fracture, and is readily disintegrated. The dust, when inhaled by the nose in the act of powdering, causes long continued spasms of sneezing, occupied with distress about the forehead and eyes.

Chemical Examination of Sassy Bark.—It is stated in the works of systematic botanists that the secretion of tannin and gum is a marked feature of that portion of the Leguminosæ included in the sub-order Mimoseæ, of which the Acacias may be quoted as an example. The intermediate sub-order Cæsalpinisæ is also largely characterized by species abounding in tannin, of which the *Hæmatoxylon* may be instanced. The sassy bark tree is largely tanniniferous, and the bark might be used for tanning purposes in its native country. Gum does not exist largely in the bark, but, as has been said, is found in and around the seed; and as it is probable that

the gum-bearing character of the *Acacias* may be due more to disease, or to an interruption of the normal condition of the circulation of the trees by punctures or incisions, than to an overflow or superabundance of that principle; the comparative absence of gum from sassy bark is no reason why it should not rank in that sub-order.

A thousand grains of the bark, in powder, moistened with water, was put into a glass percolator, and half a pint of strong infusion obtained by pouring water slowly on the bark. This was set aside, and the additions of water continued during two days, until the fluid passed tasteless and colourless. The residue dried at the temperature 90°—100° F., weighed 840 grains.

The clear infusion had a dark red colour, and was not coagulated by heat. Sesqui-chloride of iron caused a flocculent precipitate of a greyish black colour. Neutral acetate of lead, proto-chloride of tin, bichloride of mercury, and sulphuric acid, produce copious precipitates, and a solution of gelatine, affords a flocculent deposit. These tests indicate *tannic acid* in abundance; but its reaction with the persalts of iron and tartar emetic, the latter causing only a slight opalescence, indicate one of the modified forms of that acid.

When the tannin was removed from the infusion by gelatine in excess, and the liquid filtered, sesqui-chloride of iron caused a black colouration, which disappeared by heat. When the infusion was treated with a solution of neutral acetate of lead to remove the tannin and colouring matter, the filtered liquid afforded but a slight precipitate with subacetate of lead, indicative of but little soluble gum.

The residue of the sassy bark, after exhaustion with cold water, was boiled in water, and the transparent decoction filtered hot. As it cooled, a deposition of brownish red apotheme occurred, which was soluble in diluted alcohol and alkaline solutions, had but little taste, and that slightly astringent, due perhaps to a little unaltered tannin adhering, as it was coloured blackish brown by sesqui-chloride of iron. This altered tannin exists in considerable quantity, as will be shown in a following experiment.

The cold decoction was not coloured blue by solution of iodine.

The dried residue of the sassy was then exhausted with cold-alcohol by displacement, yielding a dark kino-coloured tincture, from which water precipitated a reddish-brown substance. This tincture was evaporated to dryness, the residue reduced to powder, and a portion exhausted by chloroform, which left a brown residue soluble in alkaline liquids and diluted alcohol. The chloroform solution by evaporation deposited a mixture of fatty matter and resin both in small quantity.

Five hundred grains of the bark in powder was displaced with commercial ether, so as to obtain six fluid ounces, and the tincture evaporated to dryness spontaneously. This extract, which had a deep red colour, was nearly all soluble in alcohol .835. It was treated with cold water, which softened it, dissolved out the tannin, and acquired a reddish colour. The extract was malaxated with repeated quantities of water until it ceased to lose weight. The residue was boiled in repeated portions of water till it was exhausted by that menstruum. The residue was soft and fusible at 212° F., had little odour, was soluble in alcohol, and burnt with a suttly flame, with a large carbonaceous residue. This was then treated with chloroform by trituration and thrown on a close filter; the larger part was dissolved, forming a light brown solution, which yielded a soft, brownish matter by evaporation. This substance fused by a gentle heat, caused a greasy stain on heated paper, and was dissolved by warm solution of potassa, from which muriatic acid precipitated it in minute brownish globules, and is a mixture of resin and fatty matter. The undissolved portion left on the filter was apotheme, dissolved by the alcoholic ether first used. It was a brownish red powder, soluble in alcohol, insoluble in anhydrous ether and cold water; but dissolved partially by boiling water, and by solution of potassa, and swells up without disposition to inflame when heated.

The residue of bark left by the ether was extracted with alcohol, and this evaporated to dryness. This extract was exhausted with water and dried. The residue was completely insoluble in chloroform, swelled up when heated, was partly soluble in boiling water, very soluble in diluted alcohol and in alkaline solutions, and consisted almost wholly of a substance allied to the apotheme of *Krameria triandra*.

3500 grains of sassy bark in coarse powder, was exhausted by alcohol, .835 by maceration and percolation, and the tincture evaporated on a water-bath to a soft extract, weighing 950 grains, which was used as the basis of a series of experiments for the active principle.

200 grains of alcoholic extract of sassy was triturated with 120 grains of calcined magnesia, and sufficient water to effect the combination of the tannin and

colouring matter with that earth, and then dried at 212° . The mass, reduced to powder, was exhausted with boiling alcohol, and the liquid evaporated to half an ounce and set aside. As the liquid disappeared by spontaneous evaporation, an oil-like matter separated on the sides and the surface.

200 grains of the same extract was treated in the same manner with 200 grains of lime, previously hydrated. As the alcoholic liquid evaporated, the same oily looking matter was eliminated.

200 grains of the extract was treated with 100 grains of hydrated protoxide of lead (carefully freed from alkali by washing) in the same manner and on evaporating the alcoholic liquid the same product was obtained.

This substance is very soluble in alcohol, soluble in ether and chloroform, and but slightly soluble in water. Its alcoholic solution slowly restores the colour of reddened litmus, but when heated with very dilute hydrochloric acid, it was not dissolved. Its solution in boiling water afforded a curdy precipitate with tannic acid. When heated to redness on glass or platina, a minute ash of white colour remains, which is alkaline in its action on moist reddened litmus. It has little if any odour or taste, and a grain of it given to a cat, produced no poisonous effect, and consequently it is not the active principle. An analogous experiment of Mr. Santos (*Am. Jour. Pharm.* vol. xxi. p. 100,) yielded him "a few grains of a crystalline matter, having a white colour and nauseating taste," which the paragraph following states was poisonous when tried on animals.

200 grains of the same alcoholic extract was triturated with half a pint of water, filtered, and the clear reddish brown solution filtered and refiltered through a layer of purified animal charcoal, previously boiled in alcohol. The charcoal was then washed, dried, treated with boiling alcohol, and this evaporated. A reddish brown amorphous residue was left without any indications of crystals, as obtained by Mr. Santos when a weak tincture was thus treated.

5000 grains of the bark in powder was exhausted with cold water by maceration and displacement, the coloured astringent infusion precipitated with subacetate of lead, and the excess of lead removed from the colourless liquid by sulphuric acid carefully added. The filtered liquid was evaporated on a water bath; before acquiring a syrupy consistence tufts of crystals separated, which were removed and set aside. The evaporation was continued and the residue treated with boiling alcohol, which on evaporation yielded a brownish, syrupy, deliquescent substance, exhibiting no disposition to crystallize. A portion of this given to a cat produced no symptoms of poisoning.

The crystalline matter which consists of sulphate of lime and an organic salt of lime, has not been sufficiently examined.

From the foregoing observations it is apparent that neither of the substances described is the active principle. I am convinced that when isolated it will be found to possess great activity, as three grains of the aqueous extract of sassy given to a cat, caused violent poisonous symptoms, great prostration, frothing at the mouth, moaning, dilatation of the pupils, and total indisposition for food. Another series of experiments are now in course, the results of which will be tested physiologically; but as they cannot be concluded in time for this essay, they will, if successful, form the subject of a future communication.

The organic substances detected are tannin, an insoluble apotheme analogous to those in *Krameria*, and a combination of these, which constitutes the red colouring matter of the bark, gallic acid, gum, resin in small quantity, fatty matter, and a peculiar matter precipitable by tannin, and soluble in alcohol and chloroform, but which is not the active principle.

Inorganic constituents of Sassy bark.—2000 grains of the bark in small fragments, was charred and partially incinerated in an earthen crucible, and the incineration afterwards completed in a platina crucible, using a green glass rod to the contents occasionally. Sixty grains, or three per cent. of a light coloured grey ashes resulted.

The ashes were treated with boiling distilled water in successive portions till exhausted; the filtered lixivium, which was alkaline to test paper, yielded by evaporation 3.6 grains of a white amorphous residue. This was dissolved in water, neutralized with nitric acid, which caused effervescence, and filtered.

The clear solution afforded no precipitate with ammonia, potassa, or their carbonates, oxalate of ammonia, ferrocyanuret of potassium, hydrosulphuret of ammonia, or with phosphate of soda and ammonia.

When a portion of the solution was evaporated, it yielded crystals of nitrate of potassa. A solution of tartaric acid caused the gradual production of a white

crystalline precipitate of bitartrate of potassa, and bichloride of platinum a yellow one in octohedrons.

Nitrate of silver threw down a white precipitate, soluble in ammonia, and nitrate of baryta a white dense one insoluble in nitric acid.

The soluble portion of the ashes therefore contains, *carbonate and sulphate of potassa and chloride of potassium*, without lime, magnesia or iron associated.

The portion of the ashes insoluble in water, was treated with diluted muriatic acid, which dissolved nearly all with violent effervescence, and then evaporated to dryness. The dry mass was treated with boiling distilled water thrown on a filter, the greenish grey residue washed with distilled water, and the washings added to the first liquid, which was perfectly colourless. This was divided into two parts and one set aside.

This solution when much diluted, was not precipitated by caustic ammonia or potassa, but when not diluted, these reagents and their carbonates produced abundant white precipitates. Phosphate of soda caused a bulky white precipitate, soluble in muriatic acid. Oxalic acid and oxalate of ammonia each produced white granular precipitates soluble in nitric acid. Sulphuric acid caused no precipitate in the dilute solution, but an abundant crystalline one when stronger. All the tests indicated lime in abundance.

When the lime was separated by muriate and carbonate of ammonia, the filtered solution yielded no precipitate with phosphate of soda and ammonia. Chloride of barium caused no change. Hydrosulphuret of ammonia produced a slight black precipitate and ferrocyanuret of potassium, after standing a while, caused a slight white deposit, but no evidence of iron.

The reserved half of the solution obtained from the ashes, was then treated with an excess of solution of oxalic acid, and after the deposition of oxalate of lime ceased it was collected, washed, dried, and ignited at a dull red heat, and the resulting carbonate of lime was found to weigh twenty-one grains, equal to forty-two grains from the whole of the bark treated, or about two per cent. It is probable that the greater part of the lime exists in the bark in combination with a vegetable acid as the ashes, which were obtained by gradual incineration, at a comparatively low temperature, contained the lime as carbonate. A portion of the lime probably exists as phosphate.

The portion of the ashes left on the filter after treatment diluted with muriatic acid and distilled water, was heated in strong muriatic acid, which dissolved all but a little silica and grit, and acquired a greenish yellow colour. This solution when diluted, gave evidence of iron by ferrocyanuret of potassium. It was then boiled with acetate of soda and acetic acid, and the gelatinous precipitate of the phosphate of iron dissolved in muriatic acid and heated with an excess of potash, by which the iron as sesqui-oxide, was precipitated. The liquid left afforded no precipitate of alumina with an excess of acetic acid.

The insoluble portion of ashes consists chiefly of carbonate and phosphate of lime, phosphate of iron, and silica, without magnesia or alumina.—*American Journal of Pharmacy.*

ON BOEHMERIA NIVEA, OR CHINESE GRASS-PLANT, AND ON BOEHMERIA PUYA.

BY SIR W. J. HOOKER, K.H., D.C.L., OXON.

JACQUIN, in his *Selectarum Stirpium Americanarum Historia*, 1763, first established the genus *Boehmeria*, but so little did he understand the genus himself, and so minute are the characters, that in 1770 he published a figure of *Urtica nivea* as still an *Urtica*, which is now universally included in *Boehmeria*. The chief distinction consists in *Urtica* having a 2-valved perianth to the female flower, while that of *Boehmeria* has a tubular perianth, more or less distinctly 4-lobed at the apex. Whenever the entire family of *Urticeae* shall have received the attention it deserves from the studies of a competent botanist, the characters of these and allied genera will be reformed. Our object at present is chiefly with particular species.

At p. 25 of the first volume of the present series of the *Journal of Botany*, or *Kew Garden Miscellany*, we noticed a very valuable textile from China, recently known to the merchants of Europe by the name of "Chinese Grass," and the beautiful material manufactured from it as Chinese grass cloth. By the assistance of Dr. Wallich and Sir George Staunton, we ascertained that this was no grass at all, but

the produce of a kind of *nettle* of the East Indies and China, known to botanists as the *Urtica nivea*, of Linnæus, or *Boehmeria nivea*, Gaudichaud. Shortly after, at p. 159 of the same volume, we gave an extract from a periodical at Berlin, *Naturforschende Freunde*, in which Dr. Münter had endeavoured to show that the *Chinese grass cloth* was derived from the fibre of the Jute, *Corchorus capsularis*, a plant of which an account may be found at p. 25 of our same volume of this Journal, and at p. 91 and tab. 3 of the following volume (vol. ii.) there is a description and figure. That, however, is a fibre we wholly derive from India proper, and however valuable commercially, it is very inferior in quality to the Chinese grass. This error we endeavoured to correct; nevertheless statements are again issued, contrary to what is the fact, by merchants interested in the subject of the "Chinese grass," stating that it is a "kind of *cannibis*, or *hemp*;" and we presume, because the hemp is a plant whose cultivation is suited to our climate, so they recommend this as a fit object for cultivation with us, and seed has been imported and distributed accordingly. Long previous even to the time when the commercial importance of the fibre became known among us, we had raised this plant, and had it in cultivation in a hot-house or in a warm green-house. This present year we have planted it in the open ground, rather with a view of showing that it cannot succeed, than with a hope of its bearing our climate unharmed, save during the hottest of the summer months.

But this is no reason why the "Chinese grass" should not be cultivated, and advantageously in our colonies, that is, such of our colonies as possess a climate nearly analogous to that of Canton; and we cannot doubt that it would, with due care, prove a most valuable and important article of export. It is only a true and correct knowledge of such plants, and of the peculiarities of soil and climate necessary for their being successfully reared, that can enable us to grow them to good purpose.

The second plant, of which we here give a brief description, we at present know less about; it is the "Pooah," "Puya," so called in Nepal and in north-eastern India (*Boehmeria Puya*, Wallich). What we do know is given at p. 26 of the first volume of this Journal; but although all that we have yet seen of the cloth made from it by the natives of Sikkim be of a very inferior quality, yet, properly prepared, it is likely, judging from the close affinity of the two plants, that it may be found equal to that from the *B. nivea*. We trust it will soon be put to the test.

There can be no doubt that many mistakes about plants originate in the English vernacular names that are assigned to them, too often in such a way as wholly to mislead: as, for example, the *Prunus Lauro-Cerasus* is called "Common Laurel" (it being a kind of plum or cherry); and *Ilex*, which means a holly, is applied to a kind of oak, &c. &c. Why the Chinese nettle was called "Chinese grass" I cannot tell, nor is it worth the time to consider or inquire; but assuredly, as far as can be done, since the Latin scientific names are not palatable to the uninitiated, it is very desirable to give such English names as may lead the mind to a familiar object, with which the one in question has some resemblance. In the present case the name of "Chinese nettle," in lieu of Chinese grass, would appear to be an improvement; but then, it may be asked, why, if a "nettle," is not its proper Latin name "*Urtica*?" To this we have to answer, that the niceties of botanical discrimination require that this plant and the *Puya* should be separated from the true nettles. We then propose the word *Boehmer-nettle* for those plants which in botanical language are called *Boehmerias*.

1. BOEHMERIA NIVEA, Gaud.

Chinese Boehmer-Nettle, or Chinese Grass-Plant.

Fruticosa erecta, caule petiolisque patentipilosis, foliis alternis longe petiolatis latocordatis basi 3-nerviis subito anguste acuminatis grosse serratis subtus dense albanosis, paniculis axillaribus, masculis superioribus, floribus glomeratis, glomerulis subsessilibus, pericarpis basi attenuatis.

Boehmeria nivea, Gaudich., in *Frey. Voy. Bot.* p. 499 (*excl. syn.* Rumph.) Miq. in *Plant. Jungh.*, p. 33.

Urtica nivea, Linn., *Sp. Pl.*, p. 1398 (*excl. syn.* Rumphii) Lour. *Fl. Coch.*, v. ii., p. 682. Jacq., *Hist. Schenbr.*, v. i., t. 166. Willd. *Sp. Pl.*, p. 565. Wall. *Cat.*, n. 4606.

Urtica tenacissima, Roxb. *Fl. Ind.*, v. iii., p. 590. Wight. *Ic. Pl. Ind. Or.*, v. ii., t. 688.

HAB. China. Inhabiting walls, according to Linnæus; most extensively cultivated there. Native also, of the island of Sumatra, according to Marsden, cultivated on account of its fibre, and called "Caloöse." Pulo Penang, probably only culti-

vated where it has the Malay name of "Rami" (Roxb). Cultivated in the Botanic garden of Calcutta, where it thrives exceedingly, and "strikes as readily from cuttings as the willow." Roxb.

A shrub, three to four feet, or probably more in height, erect, branched, the young branches green and hairy with short spreading hairs. Leaves alternate (characteristic of the division *Procris* of *Boehmeria*, according to Gaudichaud. Leaves on long petioles, broadly cordate, but having no sinus or lobes at the base, the base rather truncate, or tapering suddenly into the petiole, the apex suddenly acuminate into a slender point, almost caudate, the margin coarsely serrated, full green above, white with dense fine down beneath, 3-nerved at the base, the rest of the leaf penninerved; the principal nerves united by slender nervelets. Petiole, terete, hairy. Stipules subulate, brown, deciduous, soon becoming brown. Peduncles about two together, axillary, slender, filiform, paniculate, bearing nearly sessile clusters or glomerules of flowers throughout their length, hairy. Male panicles below; female above. Male flowers few in each glomerule. Perianth deeply 4-partite, hairy externally; the segments ovate. Stamens four, spreading; rudiment of an ovary. Female flowers several in a globose glomerule. Perianth of one piece, oblong-cylindrical, very hairy, 4-toothed. Ovary included: style thick-subulate, much exerted beyond the perianth, hairy. Achamenium, when ripe, obovate, substipitate.

2. BOEHMERIA PUYA.

Nepal Boehmer-Nettle, Pooah or Puya.

Fruticosa elata erecta, caule petiolisque appresso hirsutis, foliis alternis sublonge petiolatis lato-lanceolatis e basi parallelo-trinerviis anguste acuminatis per grosse serratis subtus albidio-lanatis, paniculis axillaribus, floribus glomeratis, glomerulis subsessilibus, pericarpis basi obtusissimis.

Urtica Puya. *Herb. Ham.*—Wall. *Cat.*, n. 4605.—Hook. in *Kew Gard. Misc.*, v. i., p. 26 (*Boehmeria*).

Urtica frutescens, Roxb., *Fl. Ind.*, v. iii., p. 589 (*excl. Syn.* Thunb. et Willd).

Pooah, Campbell in *Trans. of Agric. Soc. of India*, 1847.

HAB. Mountains north of Bengal and Oude, Roxburgh. Nepal, Hamilton, Wallich. Mountains of Eastern Nepal and Sikkim, at the foot of the hills skirting the Terai, to the elevation of 1,000 and 1,200 feet, and on the mountains up to 3000 feet, in open hilly places, Dr. Campbell. Dr. Wallich gives, doubtfully, in Taong-Dong, Ava. The north-eastern boundary of Bengal appears to be its native locality.

This grows to the height of six to eight feet. The leaves, it will be seen, are very different from those of *B. nivea*; the male flowers very similar: the female we have seen only few and imperfect, and much advanced. The pericarp, or seed, is quite unlike that of the *B. nivea*. For the particulars and uses of this species we must refer to the first volume of the *Kew Garden Miscellany*, and to Dr. Campbell's memoir above quoted.

ON THE DETECTION OF RESIN OF JALAP, RESIN OF GUALIACUM AND COLOPHONY, IN THE RESIN OF SCAMMONY.

BY M. THEOREL.

In expressing the opinion, some time ago, that the resin of scammony was the part of the drug that ought to be administered as a therapeutic agent, I conceived that this resin ought always to be prepared by the pharmacist himself.

Whenever the pharmacist, from any cause, is prevented from preparing it, and is obliged to purchase that which is met with in commerce, it is necessary that care should be taken to ascertain that it is pure.

Any adulteration would soon be discovered, unless the substance added was in small quantity or its action similar to that of the resin itself. Resin of jalap being of the latter class, and being at the same time cheaper than resin of scammony, has been used for adulterating it. The fraud is a very unjustifiable one, notwithstanding the fact that the substance used is somewhat similar in action, for no substitution of one agent for another, should be tolerated in medicines.

I propose, for the detection of this fraud, a method which is founded on the perfect insolubility of resin of jalap in rectified ether, and the solubility in all proportions of the resin of scammony in this menstruum.

There are other substances, besides resin of jalap, which are used for adulterating

resin of scammony, such as resin of guaiacum and colophony, and these are still more objectionable, as they are inert.

Resin of guaiacum may be easily detected by means of nitrous acid gas, or bichloride of mercury.

There are several reagents which may be used for detecting the presence of colophony in resin of scammony. Among them is oil of turpentine, which dissolves colophony at common temperatures, and leaves resin of scammony almost wholly unacted upon.

But the best reagent for this purpose is sulphuric acid, which possesses the property of dissolving many resins, and of modifying, more or less, their composition. If a little of this acid be poured over colophony, it immediately, and by simple contact, develops an intense red colour. The same acid, when poured over pure resin of scammony, produces, on the contrary, no immediate change; it is only, after the lapse of some minutes, and with contact of the air, that it becomes coloured, and then but slightly, the colour being that of wine dregs.

By this means, the presence of one-twentieth part of colophony may be detected in resin of scammony. For this purpose, it is only necessary to put 25 or 30 centigrammes of the resin into a glass or porcelain mortar, to add four or five grammes of the oil of vitriol of commerce, and to rub it with the pestle. If the resin of scammony should contain colophony, the mixture will at once become red, but if on the contrary it is pure, it will only become coloured after some time.—*Repertoire de Pharmacie*.

ON THE ANTA OR VEGETABLE IVORY.

BY M. BERTHOLD SEEMANN.

Highly interesting is the *Antà*, a species of *Vegetable Ivory* (*Phytelephas*, sp.) distinct probably, from that of the Magdalena. It grows in low damp localities, principally on the banks of rivers and rivulets, and is diffused over the southern parts of Darien, and the vicinity of Portobello, districts which are almost throughout the year deluged by torrents of rain, or enveloped in the thick vapour that is constantly arising from the humidity of the soil and the rankness of the vegetation. It is always found in separate groves, seldom or never intermixed with other trees or bushes, and where even herbs are rarely met with, the ground appearing as if it had been swept. In habit it resembles the *Corozo colorado*, or oil palm (*Elaeis melanococca*, Gærtn.); so much, indeed, that at first sight the two are easily mistaken for each other. Both affect similar localities; and have trunks which, after creeping along the ground a few yards, ascend, and attain about an equal height. Their leaves, also, resemble each other; and their fruit grows in a similar way, attached to short peduncles, and almost hidden in the axils. The habit, however, is nearly the only link that connects the *Antà* with the order of palms: in flower, stamens, the organization of the fruit, in fine, in almost every essential character, it differs so widely from that family, that it cannot but be separated, and united with *Pandaneæ*. This species of *Phytelephas*, as has already been stated, is probably distinct from that growing on the banks of the Magdalena. The trunk creeps along the ground, and then ascends, seldom, however, higher than from four to six feet; it is always pulled down, partly by its own weight, partly by the aerial roots, and thus forms a creeping caudex which is not unfrequently more than twenty feet long. The top is crowned with from twelve to sixteen pinnatifid leaves, the entire length of which is from eighteen to twenty feet. The leaflets, or rather segments, are towards the base of the leaf alternate, towards the apex opposite: they are three feet long, two inches broad, and their entire number generally amounts to 160. All the plants which I saw were dioecious, the males always being more robust, and their trunks more erect and higher than the females. The flowers of both emit a most penetrating almond-like smell, which attracts swarms of honey-bees, chiefly the stingless species inhabiting the forests. The male flowers are attached to fleshy spikes, which are from four to five feet long, and are hanging down. The female flowers appear in bundles, on short thick peduncles, and stand erect. The fruit, being a collection of drupes, forms large heads, and is at first erect, but when approaching maturity its weight increases, and the leaf-stalks, which so long supported the bulky mass, have rotted away, it hangs down. A plant bears at one time from six to eight of these heads, each of which contains on an average eighty seeds, and weighs, when ripe, about twenty-five pounds. The uses to which the *Antà* is applied by the Indians are nearly the same as elsewhere. With its leaves their huts are thatched, and the young liquid albumen is eaten. The "nuts," however, are turned to no useful purpose. The

Spanish-Isthmians did not know, before I visited the Isthmus, that *Vegetable Ivory*, or *Marfil vegetal*, as they call it, existed in their country; and, although they have been told that with the produce of the groves of Darien whole ships might be loaded, no one has yet taken advantage of the discovery.—*Hooker's Journal of Botany*.

ON THE SIMABA CEDRON.

BY M. BERTHOLD SEEMANN.

A TREE, which has attained great celebrity, is that called *Cedron* (*Simaba Cedron*, Planch.). The most ancient record of it which I can find is in the *History of the Buccaneers*, an old work published in London in the year 1699. Its use, as an antidote for snakes, and place of growth, are there distinctly stated; but whether on the authority of the natives, or accidentally discovered by the pirates, does not appear. If the former was the case, they must have learned it while on some of their cruises on the Magdalena, for in the Isthmus the very existence of the tree was unsuspected until about 1845, when Don Juan de Ansoatigui ascertained, by comparison, that the *Cedron* of Panamá and Darien was identical with that of Carthagea. The virtues of its seeds, however, were known, years ago, from those fruits imported from the Magdalena, where, according to Mr. William Purdie, the plant grows in profusion about the village of San Pablo. In the Isthmus it is generally found on the outskirts of forests in almost every part of the country, but in greater abundance in Darien and Veraguas than in Panamá. The natives hold it in high esteem, and always carry a piece of the seed about with them. When a person is bitten, a little, mixed with water, is applied to the wound, and about two grains scraped into brandy, or, in the absence of it, into water, is administered internally. By following this treatment the bites of the most venomous snakes, scorpions, centipedes, and other noxious animals, have been unattended with dangerous consequences. Doses of it have also proved highly beneficial in cases of intermittent fever. The *Cedron* is a tree, from twelve to sixteen feet high; its simple trunk is about six inches in diameter, and clothed on the top with long pinnated leaves, which give it the appearance of a palm. Its flowers are greenish, and the fruit resembles very much an unripe peach. Each seed, or cotyledon I should rather say, is sold in the Chemist's shops in Panamá for two or three reals (about 1s. or 1s. 6d. English), and sometimes a much larger price is given for them.—*Ibid*.

NEW COMPOUND OF VOLATILE OIL OF TURPENTINE.

BY M. A. SOBRERO.

HUMID volatile oil of turpentine rapidly absorbs oxygen under the influence of light. A crystalline substance is formed, the composition of which we cannot express by means of any of the formulæ, at present known, of the different hydrates of essence of turpentine.

In order to obtain this body, a flask, filled with water, is to be inverted in a water-bath, and oxygen gas passed into it, to about four-fifths of its capacity, then volatile oil of turpentine is to be introduced in sufficient quantity to form a layer of about half a centimetre, in thickness, in the flask. The apparatus thus arranged is to be exposed to the direct action of light. In a short time there forms, on the internal surface of the flask not touched by the water, a crystalline body, which takes the form of small prismatic needles, the size of which gradually increases, and after a few days, are sometimes a centimetre or more in length.

At the same time the liquid rises in the flask, which would become filled, if care were not taken to arrange the apparatus in such a manner that the air may pass through while absorption is taking place.

By arranging several flasks in the manner described, a considerable quantity of this crystalline body may be obtained.

In order to separate and purify this body, the flasks are to be removed from the baths in which they were immersed, and, after having allowed the oil and water to run off, a small quantity of alcohol is to be poured in, which rapidly dissolves the crystals. The solutions added together yield, by evaporation, the crystalline body coloured with oil of turpentine. It is purified by means of repeated crystallizations in alcohol and in water.

This body is inodorous; it is soluble in alcohol, in ether, and in water. Its aqueous boiling solution yields it in long prisms, which assume a star-like arrangement.

This body decomposes when boiled with water, slightly acidulated by sulphuric

acid, and yields a volatile product, having a pungent odour resembling that of oil of turpentine or camphor. This latter character distinguishes it from the hydrate of turpentine of Wiggers, which, by the same reaction, gives an oily volatile body, with the odour of hyacinths.

The composition of this body is represented by the following formula:— $C_{20}H_{12}O_2 + 2HO$.—*Repertoire de Pharmacie*.

ON PEACH-LEAF WATER.

BY MESSRS. FELLEBERG AND KÖNIG.

THE authors distilled in 1847* and 1848. peach leaves with water, and the difference in the proportions of prussic acid in these two sorts of water was very considerable. The leaves which yielded the smaller proportion of prussic acid, were those of the year 1848, when the tree had an abundance of fruit, whilst in the year 1847, it had only one fruit. Mr. König in Bern, found in 1000 parts of a peach-leaf water, prepared by himself, 1.407 of prussic acid. That prepared by Fellenberg in 1848, contained in 1000 parts, 0.437 parts.—*Central Blatt*, No. 23, 1851, p. 368.

ON CAMPHINE.

THE following directions for preparing camphine for lamps are contained in the *Wochenschrift des Polytechn. Vereins in Würzburg I. Jahrg. No. 5*: take one pound (Bavarian avoirdupois weight) of purified oil of turpentine, free from resin, one ounce of pure sulphuric ether, and half an ounce of camphor. Dissolve the camphor in the ether, add the solution to the turpentine, and apply a gentle heat until the liquid becomes as clear as water.

Oil of turpentine may be purified by impregnating the saw-dust of pine tree-wood with the oil of turpentine, introducing it into a still arranged for distillation by steam, and distilling the oil over in the usual way, by conducting steam into it. The oil is then heated, in order to deprive it entirely of the water which has passed over during the distillation, and is then to be decanted. The residue in the still, consisting of saw-dust and resin, mixed with coal-dust and clay, can be advantageously employed as fuel.

Dr. Buchner's opinion is, that the addition of camphor is quite superfluous, and also that the proposed method of purifying the oil is quite unnecessary. For if the oil is cautiously shaken with a proportionately small quantity of sulphuric acid and then left standing, a dark-brown charred resinous substance separates with the water, and the oil, when poured off, although of a yellowish colour and changed odour, appears perfectly adapted for the camphine-lamp. Too much sulphuric acid, however, must not be added at once, because in this case a violent reaction takes place, accompanied with a strong development of heat, and a large portion of the oil of turpentine would then become volatilized. Dr. B. thinks it probable that in England rectified coal-tar oil is sold and consumed as camphine. The pound of camphine is sold in Bavaria for twenty-four to twenty-seven kreuzers, equal to ninepence.

In order to determine the respective values of camphine-light, oil-lamp-light, gas-light, and wax-candle-light, the Society for promoting arts and trades in Hamburg has instituted a number of photometric experiments, made under the superintendence of Messrs. Bubendey, Plath, and Ruete, which have been published in the *Journ. f. Prakt. Chemie*, lii., 314.

The oil-lamp employed in these experiments was the so-called Carcels-lamp, as described in Knapp's *Lehrbuch f. Chem. Technologie*, I., 124.

The lamps were arranged and lighted about two hours before the commencement of the photometric comparison. In order to determine the consumption, the lamps with their contents were weighed before lighting and at the close of the experiment. The photometer employed was one of Wright's, and the gas-lamp was provided with a so-called economical burner, and gave at a pressure of 0.6 inches before the burner, and a consumption of five cubic inches per hour, a light of $17\frac{1}{2}$ wax-tapers, of thirteen inches length, six to the pound. In order to obtain more exact results, the experiments were reduced to the cost of light during twelve hours, which was for the gas-light 3.83, equal to 0.447d.; camphine-lamp 1.35, equal to 0.858d.; Carcel-oil-lamp 10.42, equal to 1.2d.; wax-taper 82.80, equal to 9.7d.

In a second experiment, in which the proportions of intensity and cost of light during twelve hours were not compared with a gas-flame, but directly with a wax-taper of the length and weight stated above, the relative cost was, gas 3.83; camphine 6.25; oil 8.15; wax 82.80.

The intensities of the different lights were, gas-flame, with a burner of twenty holes and $\frac{1}{4}$ diameter, 17 $\frac{1}{2}$; camphine-lamp 11; oil-lamp 10 $\frac{1}{2}$; wax-taper.

The relative cost for an equal intensity of light by these four materials during an equal space of time would be, gas 16; camphine 29; oil 39; wax 346.—*Buchner's Report*, 3th Reihe, Bd. iii. Heft 2, p. 224, 1851.

NEW METHOD OF PREPARING NITROGEN AND CHLORINE.

BY M. E. J. MAUMENÉ.

THE processes for the preparation of nitrogen are now sufficiently numerous, but, with the exception of the decomposition of air by the metals, others of greater simplicity are desirable. The following process is perhaps to be preferred, *although it forms chlorine as well as nitrogen*. This process consists in causing nitrate of ammonia to react on the hydrochlorate of the same base, at a slightly elevated temperature.

We have theoretically:



Experience here agrees with theory: as soon as the mixture attains the temperature at which the nitrate fuses, a rapid action takes place, furnishing the results indicated. After the first few moments the fire may be removed; as the decomposition continues and is perfected almost entirely of itself.

The preparation thus executed may become dangerous for two reasons:—1. Because it forms, with great rapidity products which are all gaseous; and, in acting on a tolerably large quantity of matter, there is always a chance of an explosion; 2. Because a mixture of the two salts becomes pasty, froths up considerably, and congeals in the neck of the retort, causing a complete obstruction.

These difficulties are easily remediable, by not acting on so large a quantity of the mixture at one time, and by adding about four times its weight of sand. By these means this process may be classed as one of great simplicity. In a few instants, the heat causes the development of the gas without smoke and tumult. By lowering the temperature the operation rapidly proceeds with great regularity.

The following are the proportions for the preparation:—

Dry nitrate of ammonia	3iiss.
Dry hydrochlorate of ammonia	3viiss.
Sand	3xiiij.

These proportions yield 26 litres of nitrogen, and 5 litres of chlorine.

I think it superfluous to add, that the heat applied is sufficiently high to prevent the production of chloride of nitrogen. In no case has the gas had the slightest odour of it.

When the proportions indicated for the mixture are strictly followed, and when the salts are pure, we only obtain water, nitrogen, and chlorine.

This mode of producing chlorine without binoxide of manganese may perhaps be of some interest, especially as the substances used in its production are becoming daily of less cost.—*Comptes Rendus*.

STRAMONIUM SEGARS.

To the Editor of the *Pharmaceutical Journal*.

SIR,—Enclosed I beg to hand you a copy of a correspondence I have had with the Solicitor to the Inland Revenue, and should you think it worth a place in your Journal, the information contained therein may save from annoyance some members of our Society. I have manufactured a large quantity of stramonium segars, and had them exposed for sale in my window. I was much surprised on Saturday, the 8th inst., when a gentleman, representing himself as an exciseman, walked into my shop, and gave me a friendly notice, that by selling the stramonium segars I was laying myself open to an excise prosecution. Of course, I immediately put them away; but, on after consideration, thought it best to apply at head-quarters, to ascertain whether the matter stood as represented to me. The result is to be found in the following correspondence.

I remain, Sir, yours respectfully,

87, Leather Lane, Holborn.
Nov. 21, 1851.

JAMES SLIPPER.

No. 1.

Leather Lane, Nov. 10, 1851.

SIR,—I have for some months been in the habit of selling stramonium for smoking, made up in the same form as the sample now enclosed in this note. I have very

recently been told, that in so doing I am committing an offence against the excise laws, and, consequently, subjecting myself to a penalty; and, as I have no desire to put myself in such a position, I shall feel obliged if you will inform me, "whether by selling, exposing for sale, or having in my possession, stramonium scroll, made up similar to the sample I have forwarded to you, I am committing an offence against the excise laws, and exposing myself to a prosecution for the same?"

I remain, Sir, your obedient servant,

JAMES SLIPPER.

To the Solicitor of the Excise Office, Old Broad Street.

No. 2. Inland Revenue, Somerset House,
Nov. 11, 1851.

SIR,—I have to acknowledge the receipt of your letter of the 10th inst., inclosing samples of stramonium, made up for sale, requesting my opinion thereon, which I have laid before the Board for their directions.

I am, Sir, your obedient servant,

(Signed)

J. TIMM,

Mr. James Slipper.

Solicitor of Inland Revenue.

No. 3.

Inland Revenue Office, Old Broad Street, London,
Nov. 19, 1851.

SIR,—The solicitor to this department having laid before the Board your letter of the 10th inst.

I am directed to acquaint you that, provided the segars are manufactured wholly of stramonium, and are not so made up and advertised as to lead the public to believe that they are tobacco, the Board will instruct their officers not to interfere with the sale of them.

I am, Sir, your obedient servant,

Mr. Jas. Slipper, Leather Lane, Holborn.

J. CLAYTON FREELING.

EXETER DISTRICT COUNTY COURT.

Before J. Tyrrel, Esq.

ACTION FOR DAMAGES OCCASIONED BY SHEEP-DIPPING COMPOSITION.

HUGGINGS v. FROOM.

THIS case, which had been commenced about three weeks previously, came on for hearing on Thursday, October 30, and occupied nearly four days. Mr. Coleridge and Mr. G. Tanner appeared for the plaintiff; Mr. Stogdon and Mr. G. W. Turner for the defendant.

Mr. Huggins (the plaintiff) stated that he had bought Bigg's sheep-dipping composition of the defendant for several years. In 1850 he bought forty pounds of a similar composition, prepared by Mr. Froom, who lent him an apparatus for dipping. He paid particular attention to the directions sent with the composition. Used rather more water than was ordered (fifty-one gallons instead of forty-three) and dipped 229 sheep in the quantity sold him for 200. He had still enough for twenty sheep left; he assisted in the operation, and attended to the instructions given. Two or three days after the dipping, the sheep appeared stiff and could scarcely walk—they seemed to be paralysed; he examined them, and found them blistered, as if they had been scalded. After a week they would fall down, and were unable to rise again—the blisters became worse, and broke, abscesses were formed into the bone. He called in a farrier; eventually, twelve died—eleven lambs and one ewe; they turned black, the dogs and the flies would not touch them. All that were dipped were injured more or less, twenty-eight were under treatment for three or four weeks, being unable to stand, the ewes lost their teats, and out of about fifty, he had only eleven fit to breed from. He had twice seen defendant on the subject, who declined to make any compensation. He valued the eleven lambs which died at £1; the ewe at £1 10s., and the injury done to the others (217) at 3s. each.

In cross-examination, he stated that he had lost two sheep in a former year after dipping in Bigg's composition.

Other witnesses corroborated the substance of the statement.

Dr. Shapter said, Mr. Huggins had brought him some composition which he had analysed with Mr. Tucker. He found it contained ten per cent. of arsenious acid,

sixty of sulphur, twelve of potash, and eighteen of fatty matter. The effect of the potash would be to form an arsenite of potash, and the fat was merely the vehicle. He described the corrosive effects of arsenic and arsenite of potash on the skin and on abraded surfaces, and calculated, that supposing the composition to be equally diffused or dissolved in the water, and that each fleece absorbed two quarts, the quantity of arsenic applied to each would be fifty grains, which he considered enough to produce the symptoms described. He had analysed some of Bigg's composition, which was similar to the above, but that of Mr. Froom was more intimately mixed, the arsenic appeared to be more chemically combined, and therefore likely to act more powerfully.

Mr Tucker supported this evidence.

THURSDAY, OCTOBER 30.

Mr Edward Trood, of Exminster, stated that for five or six years he had bought Bigg's composition of defendant. In 1850, Mr. Froom offered some of his own composition at a cheaper rate. He bought enough for 500 sheep, and it was used according to instructions. He lost forty-five ewes and lambs, and above 200 were injured. The symptoms were the same as those described by the first witness. In 1850, Mr. Bigg had written to him to say that Mr. Froom was not his agent. He estimated his loss at £100.

On cross-examination, he admitted that he had lost about fifty sheep in 1849, but did not attribute it to Bigg's composition, which he had used that year. They died of a different disorder, called the scour. He had dipped 100 sheep in 1850, with Bigg's composition, but lost none of them. The sheep which he lost in 1849, were dipped in July, and died in November and December. Those in 1850, died within about three weeks of the dipping.

Mr. Trood, jun., confirmed the evidence. He said the instructions were attended to; the sheep after the dipping were washed with water, and wiped, not with a sponge, but with flannel or an old stocking. The instructions of Mr. Bigg and Mr. Froom were identical, except that Mr. Froom said that forty sheep should be dipped with the quantity ordered by Mr. Bigg for twenty. The directions stated that a sponge should be used. The sheep were ordered to be kept moving about for some time after the operation, and not to be turned into pasture until dry. This instruction was attended to.

Mr. John Drew, of Peamore, had for several years bought Bigg's composition of Mr. Froom. In 1850, he bought thirty pounds of Froom's composition, enough for 150 sheep. He used it on 210 sheep: knew it was poisonous, and was particular in attending to the instructions. He used flannel to wipe them. His flock suffered very much, seventy or eighty were injured, and seven died. He used on another farm thirty pounds of Bigg's composition, but none of the sheep was injured.

Mr. John Whippell gave similar evidence. He had been in the habit of using Bigg's composition. In 1850 he had some of Froom's: dipped 330 sheep; they suffered very much, eleven died. Estimated his damage at about £20.

Mr. J. H. Back, of Cadbury, had dipped 130 sheep with Mr. Froom's composition in 1850. They were much injured, but only two died.

Mr. Moon, of Kelland, had dipped 330 sheep with Mr. Froom's composition; did not use it so strong as directed; most of the sheep suffered, fourteen died. In 1849 he had used some of Froom's composition without any bad result.

Dr. Budd, of Northtawton, attended a patient at Kelland in 1850; saw Mr. Moon's sheep; described the symptoms, which were similar to those resulting from arsenic. The man who helped suffered from it. His hands were severely injured.

Mr. George Turner, of Barton, dipped 640 sheep with Mr. Froom's composition. He lost thirty ewe lambs, four store ewes, and some wether lambs. Many others suffered considerably. One of his men was injured by the composition.

Mr. May, of Dunsford, had dipped 146 sheep in the composition intended for 100. They had suffered over the back, and some of the wool was injured, but none of them died. One of his men was seriously injured.

Mr. Luston, of Brushford, had in 1850 dipped 190 in the quantity of composition intended for 150. Wiped them with linen. All were affected more or less; five died.

Mr. Mauley, of Cadbury, dipped 120 in composition half the strength recommended. Two were injured severely, several slightly; but none died.

Mr. Kingdom, of Netherese, dipped between 300 and 400, about thirty were injured severely—ten lambs died.

Mr. Dewdney, of Silverton, dipped 249. Four lambs and two ewes died; many others were injured.

Mr. Click, a sheep-dipper had dipped 4000 or 5000 in a year with Bigg's composition without bad effects.

This was the case for the Plaintiff.

FRIDAY, OCTOBER 31.

Mr. Stogden addressed the Court for the Defendant in a long and able speech. He contended that his client was not responsible in point of law for the consequences alleged to have happened; secondly, that those consequences were not referable in point of fact to the composition which he had prepared. The composition had been sold for the avowed purpose of destroying animal life, namely, the vermin on the body of the sheep. Its dangerous properties were known and properly represented, and precautions given accordingly, but no warranty. It had been used successfully and without injury in numerous cases, as he should prove in evidence. As to the second point, he maintained, that the mischief which had occurred was the result of carelessness on the part of the operators or deviation in some important particular from the instructions. In some instances sixty sheep or upwards were dipped within the hour, which did not allow time for washing off the adhering liquor—thirty or forty being the maximum number according to the instructions. Flannel, stockings, or linen rags had been used instead of sponge for wiping them, and these substances being less absorbent did not remove the liquid effectually. Some of the parties had continued adding fresh portions of composition to the liquor instead of making a new bath as often as directed, by which deviations it was contended that the strength had accumulated. *Mr. Froom* was a skilful and scientific Chemist; his composition resembled that of *Mr. Bigg*, but was more chemically mixed. *Bigg's* composition had been in great repute for many years.

Mr. Manley, of Cheriton, deposed that he had for three successive years used *Mr. Froom's* composition, without any unfavourable result.

Mr. Townsend, of Upton Pyne, had used it in 1849 with a good result; in 1850 a few of his lambs were rather stiff, but no further injury occurred; in 1851 all his sheep had done well.

Mr. Partridge, of Sandford, had for ten years used *Bigg's* composition with good effect; in 1849 he used *Froom's* with the same result. In 1850 he dipped 115; lost one, and several were injured; but they all recovered.

Mr. Sanders had dipped 156 in 1850 with *Froom's* composition. Some of them were stiff afterwards, but all recovered.

Mr. Ware, of Sowton, had dipped 220 sheep in 1850; did not wash or sponge them afterwards. Some of them were slightly injured, but none died.

Mr. Bodley, of Stockleigh, and several other witnesses, gave similar evidence.

Mr. Froom, the Defendant, stated that he had been a Chemist for many years, and his father before him from 1799. Had sold *Bigg's* composition for some years. In May, 1849, *Bigg* gave notice that he should discontinue his agency and supply the article direct; he afterwards wrote requesting him to resume the agency, but he (witness) had commenced making his own, as follows:

5lb. Arsenic,
5lb. Sulphur,
20lb. Soft Soap,
½lb. Salt of Tartar.

Had not varied the recipe in 1849, 1850, or 1851. The soap was warmed, poured into a mortar, and the ingredients rubbed together. He made 30lb. at a time. He had seen similar formulæ in standard works on veterinary medicine, some of which contained more arsenic than his own. He had furnished some of his own and some of *Mr. Bigg's* composition to *Dr. Hulme* for analysis. Believed there was very little difference: had not observed solid particles of arsenic in either.

Dr. Hulme, of Exeter, had received the samples for analysis, and had sent a portion of each to *Mr. Herapath*. The following was the result:—

FROOM'S.		BIGG'S.	
Sulphur.....	10.75	Sulphur.....	22.
Arsenic	11.64	Arsenic	20.08
Potash	7.61	Potash.....	6.56
Oil and fat	70.	Oil and fat.....	51.36
	100.00		100.00

Bigg's therefore contained much more arsenic than Froom's. There was no formation of arsenite of potash in either, as mixed with sulphur and fat there would be no contact. Putting eight pounds to forty gallons of water, he was of opinion that arsenite of potash would not be formed. Adding eight pounds of Bigg's composition to forty-three gallons of water it would be much stronger than the other; both would deposit a sediment. In Bigg's there would be more arsenite of potash, because in Froom's there was a larger quantity of oil or fat. He had made baths with a small quantity of each, using the same proportion of water at the same temperature. In Froom's he found rather more than half a grain of arsenious acid in solution, in the other about a grain. Was aware that other compositions were used, some of which were stronger. Should not anticipate any bad consequences from using Froom's composition according to his instructions, washing the sheep properly afterwards. Sponge would be better than flannel for wiping them. Considered the bad effects to have resulted from want of care in regard to the instructions given.

SATURDAY, NOVEMBER 1.

Mr. Coleridge replied. He said, the questions to be decided, were: Did the plaintiff substantially suffer by means of the defendant? Did the plaintiff comply with the instructions furnished by the defendant? Was the plaintiff or the defendant the cause of what took place? It was clear that the plaintiff had bought the composition of the defendant—that he had used it on his sheep—that from its use injury had resulted. The learned counsel enlarged upon the effects of arsenic when applied to the skin or to an abraded surface, and the comparative potency of arsenic and of arsenite of potash. He quoted several scientific authorities in support of the deleterious nature of the composition, and contended that any slight variations which might have occurred in the mode of interpreting or following the instructions, were of no practical importance, and such as any practical man preparing such a compound must have foreseen, and ought to have provided against. Admitting that Mr. Froom's composition was a better article, more chemically combined, and more skilfully prepared, he maintained that on this ground, additional precautions should have been insisted on, and that the sale of such a compound as identical with one less powerful in its effects, was unjustifiable. The addition of extra cautions in the instructions published in 1851, was a sufficient proof that the previous instructions had not been sufficiently guarded, and was, he contended, fatal to the defendant's case. He claimed on behalf of a hard-working, laborious, and industrious class of men (the farmers) protection against the dangers, losses, and disasters to which they must be exposed, by the rash and presumptuous practices of such men as the defendant (that is, the Chemists).

His Honour said that the case had been got up with the greatest possible care and talent, and argued with fairness on both sides. It was a very important case, and he would further consider all the facts before giving his judgment, which he deferred until the 29th.

CONVICTION UNDER THE ACT FOR REGULATING THE SALE OF ARSENIC.

ON Wednesday, the 17th of September, at the Manchester Petty Sessions Abraham Sefton, of Church, near Accrington, druggist, appeared to answer the complaint of Mr. Sheppard, the superintendent of police, for having, on the 4th inst., unlawfully sold to one Mary Lowe, two ounces of arsenic, the said Mary Lowe not being a person of full age; and also for having sold the same before it was mixed with indigo or soot, required by the act. The case was proved by Bing Crossley, a letter-carrier, who was present when the arsenic was sold, and who signed the book as witness of the sale. The young woman's age was nineteen. Mr. Sefton, in his defence, said, that he was not aware the law required him to colour the arsenic before selling it, and that the young woman appeared to be of full age. The magistrate inflicted a mitigated penalty of £5; the full penalty awarded by the act being £20. The poor girl, Mary Lowe, it appeared said, when applying for the arsenic, that her mother wanted it to destroy rats, but she took it herself, and died in consequence. At the inquest, the jury returned a verdict, that she destroyed herself by taking arsenic, being at the time of unsound mind.—*Morning Chronicle of Sept. 22, 1851.*

REVIEW.

THE POCKET FORMULARY, and *Synopsis of the British and Foreign Pharmacopœias, comprising Standard and Approved Formula for the Preparations and Compounds employed in Medical Practice.* By HENRY BEASLEY. Fifth edition, corrected, enlarged, and adapted to the last editions of the Pharmacopœias. 12mo, pp. 546. London: John Churchill.

This is the fifth time we have had occasion to notice this useful work. It is considerably enlarged and improved, and the possession of any of the former editions does not supersede the necessity of purchasing the present one, which is adapted to the present Pharmacopœias, and contains other new and important matter. The formulæ of the hospitals are useful to the dispenser, as prescriptions in which they occur not unfrequently find their way to Chemists' shops. At page 1 a slip of paper is inserted pointing out a few typographical errors, *which should be corrected with a pen.* This is important, as the value of a book of reference is dependent on its accuracy.

THE BOOK OF NATURE, an *Elementary Introduction to the Sciences of Physics, Astronomy, Chemistry, Mineralogy, Geology, Botany, Physiology, and Zoology.* By FRIEDRICH SCHOEDLER, Ph. D., Professor of the Natural Sciences at Worms, and formerly Assistant in the Chemical Laboratory at Giessen. Edited from the German Edition by HENRY MEDLOCK, F.C.S., Senior Assistant at the Royal College of Chemistry, London. 8vo, pp. 578. London: J. J. Griffin & Co. Glasgow: R. Griffin & Co.

THE LECTURES ON MATERIA MEDICA.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—I beg to enclose you a list of the members of Dr. Pereira's *Materia Medica* Class, whose names were not attached to the declaration presented to the Council, with the reasons assigned for their not appearing there.

I am, Sir, your obedient Servant,
CHARLES N. COTTON.

J. S. WATT. Was out of town when the declaration to the Council was presented but has signed the second declaration.

F. VARNES. Could not be found in time to sign the first, but has signed the second declaration.

W. H. SHARLAND.	— RIDLEY.	} Addresses not known, and therefore not applied to.
— HENLEY.	R. SHAW.	
— EDMONDS.	G. MASTERMAN.	

R. DICKINSON, lives with W. DICKINSON, who would not allow him to sign the first declaration, but he has signed the second.

W. DICKINSON. Refused to sign the first declaration, but has signed the second.

F. R. GARDEN.	W. BASTICK	} Refused to sign.
W. HEMINGWAY.	E. DURDEN.	

TO CORRESPONDENTS.

A CURIOUS ATTEMPT AT FRAUD.—In a publication familiarly known as "The *Piratical Periodical*," the following paragraph occurs among the Answers to Correspondents, Nov. 22: "Mr. Jacob Bell and Dr. Pereira will both see, on consideration, we are assured, that their communications are not couched in a style for publication; as regards the sentiments, they are not accordant with ours, it is true, but this would not have been held by us as a sufficient cause to refuse their announcement in our pages: our objection solely applies to the language. Dr. Pereira's request is not such as we can accede to."—It is scarcely necessary to state that no communication has ever been sent to the said periodical by either of the parties mentioned.

Carolus (London).—(1.) The principal object in adding spirit to concentrated infusions is to preserve them. For this purpose about 25 per cent. is necessary. A precipitate is thrown down, after which filtration is requisite. It is difficult by this or any other means to separate all the gum and albumen. We never recommend this class of preparations, considering them objectionable and unnecessary. Infusions are ordered when preparations *without spirit* are desired. We have already pointed out a mode of preserving them for any length of time without spirit, in stoppered bottles. The bottle

being filled, and plunged in boiling water, the stopper inserted and secured by wax. A vacuum is thus obtained, and the infusion preserved as effectually as soup or meat in tins hermetically sealed.—(2.) Nankeen die is a decoction of arnatto with carbonate of potash.

R. F. (Lutterworth).—The vinegar plant, or mother of vinegar—see vol. iii., p. 181.

Vox.—To detect albumen in urine, the tests usually employed are heat and nitric acid, both of which coagulate the albumen.

A Reader.—There is no official "Decoctum Juniperi." In Decoctum Scoparii Comp. juniper berries are one of the principal ingredients, and there is a formula for Decoct. Juniperi Comp. in the Bartholomew's Hospital Pharmacopœia as follows: *R* Juniper-berries $\mathfrak{z}\text{ij}$., Cream of Tartar $\mathfrak{z}\text{ij}$., water oiv.: boil to oij., strain, and add Compound Spirit of Juniper $\mathfrak{z}\text{ij}$.

Secundus.—Copying ink. See vol. iv., p. 100.

R. J. W. P. (Brighton).—(1.) Honey does not always become dark by keeping.—(2.) Oleum nigrum. *R* Ol. lini. 10lbs.; ol. tereb. 2lbs.; petrol. Barb. 6oz.; acid sulph. 1½oz.; mix the first three well together, then stir in the oil of vitriol.—(3.) Neat's foot oil, when prepared with care, has very little smell; we never saw any quite inodorous.—(4.) Test for the presence of lime and of chlorine.

Juvenis.—(1.) The definition is not a good one.—(2.) For *sapo mollis*, see vol. x., p. 612.

Botanicus.—Hooper's Medical Dictionary, or Hoblyn's Dictionary of Medical Terms, will be found to contain the required information.

A. Z.—(1.) No.—(2.) If the nitrate of silver and the water are perfectly pure, the solution may be kept without change.—(3.) For syrup of iodide of iron, see vol. x., p. 245, and several other articles in previous volumes of this journal. The proportion of iodide of iron present may be determined from the oxide of iron obtained by incineration.

X. Y. Z.—(1.) No.—(2.) Read Fownes's Manual of Chemistry.

A Member (Wolverhampton).—Glycerine is produced in making emplastrum plumbi

Y.—Cobalt is the basis of the blue colour usually employed in painting china.

T. F.—Acton's work on the Diseases of the Urinary Organs, is published by Mr. Chnrchill.

Vir.—Try it.

J. D. (Cambridge).—(1.) will perceive, page 256, that Dr. Pereira has resumed his lectures.—(2.) No.

J. B. (Bridport).—(1.) The questions for a prize examination are not of necessity the same as those for the examination of candidates for admission into the Society, although of a similar nature.—(2.) The Board of Examiners reports to the Council, the Council admits Members and Associates.—(3.) No examination fees at present.

W. B. (London) would be under no restriction in the case referred to.

L. G. J. (Stowmarket).—(1.) We have repeatedly stated that indentures of apprenticeship art not required.—(2.) Chrome alum is made by mixing three parts of a saturated solution of neutral chromate of potash, first, with one part of oil of vitriol, and then with two parts of alcohol, which is added by small portions at a time. No artificial heat should be applied.—*Graham.*

B. (Bridport).—What we stated is strictly true, notwithstanding the circumstance mentioned, which is unfortunate.

G. G. (Blackburn).—We regret the necessity of so often confessing our inability to recommend a book of formulæ for perfumery. We have never seen any such book.

Socius. (Lewis).—The design is not abandoned, but it may be a considerable time before its completion.

R. (Great Yarmouth).—Fownes's Chemistry, 12s.; Royle's Materia Medica, 12s.; Lindley's School Botany, Selecta a Prescriptis, 5s. or 6s.—(2.) Eau de Cologne. See vol. x., page 474.

A. P. S. (Brixton).—The regulations in the laboratory are adapted as much as possible to suit the capacity and convenience of the pupils.

Prudentia.—Phillips's translation.

J. Q.—The enclosure has been received and is appreciated.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho.

Other Communications to the EDITOR.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. VII.—JANUARY 1st, 1852.

THE PHARMACEUTICAL SOCIETY.

THERE are malcontents in every community. In every kingdom, parish, or society, there are some individuals who neither originate, nor unite in promoting, any onward movement; but whose talent consists in obstructing and opposing the exertions of others. This opposition, from whatever source or motive it may proceed, has its advantages; for it is equally true on the other side, that all governing bodies, and managing committees, are liable to fall into abuses. They may be influenced by prejudice, or dazzled by success. Their energy may flag, they may jog on in the same track, like a horse in a mill, instead of adapting their measures to circumstances as they arise; or they may be diverted from their original purpose, disagree among themselves, and betray their trust. In the event of any of these casualties occurring, a little opposition has as good an effect as a blister on the head of a comatose patient. The sense of responsibility is a wholesome restraint and stimulus, which has the double effect of checking abuse and increasing energy.

When abuses arise there is a constitutional mode of rectifying them, and those who are actuated by a sincere and honest desire to effect this object, come forward like men, openly state the grievance, demand an impartial investigation, and place the facts before the entire body of persons interested, whose prerogative it is to decide according to the merits of the question. If any delinquency be proved, the remedy consists in removing the delinquents from office, and adopting such measures as circumstances may require to rectify the evil.

Sometimes, however, this straightforward course is not adopted; but discontent is manifested in the form of anonymous attacks, and low personal abuse, and the publication of garbled statements or distorted facts. The authors of these effusions do not show their faces, but, like a secret band of socialists, assume various initials, in order to induce a belief that their name is legion. The tendency of their proceedings is to excite discord and subvert order, to undermine that which, in *propria personâ*, they dare not attack.

This is the course which has been taken by a few individuals connected with (or pretending to be connected with) the Pharmaceutical Society; and we advert to it, merely for the purpose of reminding the Members, that whatever defects may exist, either in the system, or in the management, the remedy is in their own hands. The Pharmaceutical Society was established for the purpose of uniting the Chemists and Druggists of this country, concentrating their influence, and raising their character and position, by means of education. In this union consists their strength, and the prospect of ultimate success in the desired improvement. Although the end has not yet been attained, some progress has been made, and perseverance alone is required to accomplish the rest. The existence of a few malcontents is not at all surprising, but that which has occasioned some surprise is, the continuance for ten years of a union among the members of a body, previously proverbial, for never "pulling together" for as many months, in any undertaking in which their common interests or advancement were concerned.

The constitution of the Society admits of any modification in the details of its proceedings which may be consistent with its original objects; and any Members who have duly reflected on the subject, in all its bearings, and are prepared to come forward with a tangible proposition, by way of improvement, would, by so doing, be promoting the cause, and entitled to the thanks of their

brethren. Such a proposition would be fully considered and fairly discussed; and, if generally approved, might be adopted.

Those who may be in any doubt as to the interpretation to be put upon the anonymous assertions and personal slander, should inquire into the facts. It is only by a knowledge of the truth that a correct judgment can be formed. We are quite satisfied as to the result of such inquiry, by means of which the Members will be able to judge for themselves, who are the real friends of the Society, and the sincere advocates of the objects for which it was established—those who have, from the commencement, been identified with its proceedings, or the promoters of discord and discontent, who keep out of sight themselves, while their motives are easily seen through the transparent veil which covers them.

THE PRACTICE OF HOMŒOPATHY BY CHEMISTS.

In an article on Homœopathy, in a recent number of the *Lancet*, it is stated, on the authority of another periodical, that

"The firm of Lea and Perrin, wholesale and retail Chemists and Druggists, of Worcester and Cheltenham, have agreed to retail globules in their establishment. It is to be hoped this statement will be contradicted by the firm to which it relates, or there can be no question of what will become the duty of the medical men in the counties around Worcester and Cheltenham. We do not know if Lea and Perrin are members of the Pharmaceutical Society of Great Britain; but if they should be, we commend the report of their new plan of business to the Council of that Society."

The succeeding number of the *Lancet* contained the following reply to the allegation:—

"In reply we have to state, that with regard to Cheltenham we have not, nor have had, for several years past, any interest in, or control over the business formerly carried on by us in that town; and with respect to Worcester, we never authorized the use of our names in any publication connected with homœopathy, and are at a loss to know what you refer to.

"Other parties publish in the Worcester papers long advertisements of homœopathic preparations, which we do not even expose for sale; but when requested to procure and supply such we do so, and our refusal would, in effect, be to hand over many of our best customers to the establishments of our rivals in business; therefore, in the desire to oblige those who employ us, we feel equally at liberty to procure a case of globules, or a copy of the *Lancet* for their use, if they desire it.

"We beg to add, that we are members of the Pharmaceutical Society of Great Britain, before the Council of which we have made the foregoing statement, and have obtained their unanimous sanction of the course we have pursued under the circumstances stated."

(Signed) "LEA AND PERRIN."

To this reply the following note is appended:—

"* * Messrs. Lea and Perrin have a perfect right to choose between the support of the profession, and the patrons of globulism; but we opine, that they will find it difficult to retain both.—Ed. L."

This correspondence suggests the inquiry—to what extent does the sale of globules implicate the vendor in the system of homœopathy?—in other words, what ought a Chemist to do if required to procure and furnish them?

The force of the question will be best seen, if we state more in detail the facts of the case above alluded to, which we are enabled to do on the authority of Mr. Lea.

Messrs. Lea and Perrin have an establishment at Malvern, which is a place of resort for invalids, many of whom are of the higher classes of society. They have a large share of the regular Dispensing business, but occasionally receive prescriptions of a homœopathic character, and sometimes others, which, from the smallness of the dose, may be classed as intermediate. These three varieties of prescriptions, sometimes emanating from the same source, and brought by

the same patient, place Messrs. Lea and Perrin in this position, that they must either take them as they come, or close accounts with their customers, who would, in that case, be driven to a homœopathic Chemist. Now what ought a Chemist to do in such a case? Suppose he received a prescription for a bread-pill, ordered by a regular medical practitioner, for a nervous patient, who required no medicine, and would not be satisfied without taking some, would the Chemist be justified in refusing to prepare it, because it is not sanctioned by the Pharmacopœia? And suppose that, in a similar case, the doctor orders a sugar-plum, instead of a bread-pill, is the Chemist to refuse to prepare the prescription? Among the visitors at Malvern, there may be some who are overfed, or overdrugged, and hypochondriacal, who require nothing but Malvern air and water with suitable diet, for their bodies, and a bread-pill, or a sugar-plum, for their minds. The Chemist is not supposed to know the history of each case, or the reasons why a black draught is ordered to-day and a sugar-plum to-morrow. It is the duty of the Chemist to prepare the prescriptions of the medical practitioner, who is the responsible party if he indulge in flights of fancy occasionally. It is he who inserts the thin end of the wedge, by so blending the two kinds of practice, that neither the Chemist nor the patient can perceive the line of separation.

The dispenser is in a different position from the prescriber. The medical man is free to prescribe what he may think proper. The Chemist is bound to dispense faithfully what is prescribed. If he suspect an error from the excess of the dose, it is his duty to make inquiry to preserve the patient from injury, but when no harm can arise from the prescription, when he knows not whether the remedy is for the body or for the mind, he has no alternative but to obey what he finds distinctly written. By so doing he does not make himself responsible for the practice, and is not expected to volunteer an opinion on the merits of everything he sells. If simply called upon to dispense a prescription he dispenses it, sending out for any ingredient which he may happen not to have in stock. Almost every Chemist sells quack medicines, such as Daffy's Elixir, Hunt's Pills, James's Powder, Black Drop, &c. &c. The law sanctions them, the public will have them, medical men sometimes order them, the Chemist is obliged to sell them. But he is not responsible for their effects, nor is he of necessity a quack because he sells what his customers are determined to have. He may be an enemy to quackery or to homœopathy; he may caution the public against secret medicines, or expose the fallacy of the sugar-plums, and throw the responsibility on the purchaser. To expect the general body of Chemists to do more would be folly; to single out one for public animadversion is injustice. It may be policy in some, from the particular nature of their business, to take high ground, and restrict themselves to that which is by the profession considered strictly orthodox; but others are not so circumstanced, and this is a case in which each individual must judge for himself.

The Editor of the *Lancet* should fly at higher game, and instead of attacking those who are only recognized as tradesmen, and act under professional instructions, he should level his shafts at the medical men who pander to a popular delusion. It would be quite safe to allow homœopathy and regular practice to find their level by leaving each system *singly* to show the extent of its powers. The truth will ultimately prevail; but the real offenders are the hybrid practitioners whose mixed practice may be compared to a sham donkey in a pantomime, which has legs before and legs behind to deceive the children, while the legs of the man who carries the animal are concealed behind the trappings.

DR. HENDERSON'S FIRST CASE OF GLOBULES.

At a recent meeting of the Medico-Chirurgical Society of Edinburgh, Dr. Simpson related a circumstance showing the efficacy of globules. Some eight or ten years ago, an old schoolmate of Dr. Simpson sent him a present of a case of homœopathic globules, and a very beautiful painted box it was. During the time it was in his possession, his son, then a child, occasionally used it as a plaything, and it was his amusement to uncork the bottles, empty the contents into a heap, and then refill the bottles. By this means a complete mixture of the sugar-plums was effected. One day, in Dr. Simpson's absence, a medical friend called, and seeing the box, put it in his pocket. Many weeks afterwards the new proprietor of the box met Dr. Simpson, and told him that he had produced some wonderful effects and cures with the medicines the box had contained, and that he had commenced homœopathic practice. Dr. Simpson, thinking it a good joke, did not reveal the secret. The convert continued his practice, and became a confirmed globulist. Within the last few months the subject was renewed, and Dr. Henderson (the hero of the tale) on hearing of the juvenile trick to which the globules had been subjected, called upon Dr. Simpson, to prove, that it was that particular box of medicines which had wrought his conversion to homœopathy, as he had another box at the time. At all events, he had used both, and had not found out any difference.

In further elucidation of the powerful nature of homœopathic doses, Dr. Simpson remarked, that if Adam had lived to the present time, and if he had, from the day of his birth, swallowed a billionth of a grain of sulphur every second of his life, he must continue to swallow, at the same rate, for 24,000 years yet to come, before he had swallowed a grain of a drug, of which his descendants take many grains at a dose, with little or no effect.

CASUALTIES ATTENDING THE SALE OF CATTLE MEDICINES.

THE verdict in the case of *Huggins versus Froom*, involves a principle which is applicable to the sale of cattle medicines generally. The precedent is liable to be construed, we might say perverted, to the injury of the Chemist, whenever mischief arises from the injudicious use of powerful remedies sold by him, and applied by others. The composition sold by Mr. Froom is intended to destroy animal life. The farmers who purchase it know that it is a strong poison. They know that it contains arsenic. Unless it contained arsenic or some ingredient equally potent, they would have no faith in its efficacy. Whether it be right for an agent of this nature to be trusted in the hands of farming men, is a question which we are not now discussing. The question before us is, whether the Chemist who sells it ought to be held responsible for the consequences of its application?

There is abundant evidence to show that the composition may be applied not only without injury, but with positive benefit. There is also evidence of injury having resulted from its use in some instances. When opposite results are produced by the same remedy under different circumstances and in the hands of different persons, it is reasonable to infer that the mode of application has not in all cases been the same. Who then is to blame when an accident occurs—the man who sells the composition, or the man who applies it?

If it had been warranted free from risk by the vendor, the question would have been easily answered. This, however, was not the case. Its dangerous properties were known and represented, and precautions given accordingly. It has been argued that this is an implied warranty subject to the observance of the precautions. Even if this were granted, how is positive and impartial

evidence to be obtained? The parties who apply the composition are the farmers and their men. They are the only witnesses as to the mode of application, and if they have performed their work clumsily they are not likely to condemn themselves. They may even be unconscious of any deviation from the instructions. In the hurry and confusion of catching, dipping, washing, and wiping 500 or 1000 sheep, they may unintentionally neglect some precautions, and state that the work has been properly done, believing that to be the case. If any slight deviations be proved, it is a matter of opinion whether these are of any importance or not, and in the late trial the witnesses were at issue on this point. Some of the farmers who were witnesses had met with similar accidents themselves, and their sympathies went entirely with the plaintiff. It was indeed insinuated at the trial, that they had united and shared the expenses, being all interested in the result. The defendant had no means of rebutting such testimony except by cross examination, as neither he nor any witness on his side was present at the dipping.

Yet the verdict was given against the defendant, and he was made responsible for the acts of others over whom he had no control, on the *ex-parte* evidence of those who performed the said acts.

Leaving the case of Huggins *versus* Froom without further comment, we have to consider the probable influence of this precedent on future cases of a similar nature. The chief incentive to caution in the use of hazardous remedies, is the consciousness of responsibility—the desire to escape the loss which would result from negligence. This motive is considerably weakened when the party knows that the loss, if any, will fall upon another. Without any dishonest intention, the sheep-dipper will be tempted to rely too much on the person from whom he has obtained the composition, and to underrate the importance of the part which he performs himself.

The precedent being laid down that the Chemist is responsible, and this principle applying equally to cattle medicines in general the use of which is attended with risk, actions may be brought whenever any accident occurs, and the defendant, for want of evidence, which he has no means of obtaining, may, in many instances, be the sufferer, when in fact he is not at all in fault. To meet this contingency, we suggest to those who are in the habit of selling sheep-dipping composition or other compounds of a similar nature, that they ought to protect themselves by an explicit declaration, stating to what extent they are willing to be held responsible, placing the purchaser in possession of the best information they can afford as to the precautions to be adopted, and leaving him to use his discretion at his own risk.

There is a prudential expedient, which is highly desirable, if practicable, we allude to the introduction of an application capable of effecting the desired object without the risk which attends the use of arsenical compounds. We strongly suspect that a mixture of potash, soft soap, and sulphur, without the arsenic, would be attended with a good result. Such a compound is fatal to the itch insect and some other vermin. Whether it would be as efficacious as the arsenical composition or not can only be ascertained by experience. So strong is the prejudice of the farmers in favour of arsenic, that it would be difficult to persuade them to depart from their regular habit; but after the numerous accidents which have occurred it would be wise to make the effort. Arsenic was at one time believed to be the only effectual preventative against the smut in wheat. Sulphate of copper has been found to answer quite as well, although many farmers are still wedded to arsenic.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING.

Wednesday, December 10, 1851.

MR. THOMAS HERRING, PRESIDENT, IN THE CHAIR.

The minutes of the previous Meeting having been read, the following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced :—

The *Medico-Chirurgical Transactions*, vol. xxxiv., from the Medico-Chirurgical Society.

Beasley's *Pocket Formulary*, from the Author.

From Dr. Martius.—Specimens of waifa, said to be used as a dye by the Chinese; the fruit of *Gardenia florida*; schebti; and a substance found mixed with hyraceum.

From Mr. John Ward, Ramelton, Ireland.—Specimens of kelp, of alkali salt, of muriate and sulphate of potash, and of iodine, illustrating the manufacture of these products from sea-weed on the Irish coast, at Ramelton, where a very extensive manufactory has been established.

From Mr. Daniel Hanbury.—A specimen of bark imported from Calcutta, and sold in London as *Cassia vera*. This bark differs from the ordinary cassia of commerce, and appears to be of inferior quality.

The following papers were read :—

ON MISHMEE-BITTER, OR COPTIS TEETA, OF WALLICH.

BY JONATHAN FERRIRA, M.D., F.R.S.,
Physician to the London Hospital.

AMONG the numerous and interesting drugs exhibited in the India department of the Great Exhibition, was a root marked "*Mishmee Bitter*," or "*Mishmee Teeta*," the produce of a ranunculaceous plant, called, by my friend Dr. Wallich*, *Coptis Teeta*. I have also recently received the same root in a collection of the *Materia Medica* made in Scinde by Dr. Stock, who says that the root is called "*Mahmira*," and is used in inflammation of the eyes. He adds also that, according to Dr. Royle, it is the *Ranunculus Ficaria*.

Dr. Royle informs me that Dr. Stock's reference was made to the *List of Articles of Materia Medica obtained in the Bazaars of the Western and Northern Provinces of India*, published in the *Journal of the Asiatic Society of Bengal*, in 1832. This list was copied from Dr. Royle's catalogue, but not published till after he had left India, and the reason why the name of *Ranunculus Ficaria* was appended to one kind of *Mahmiran*, was, that the description of this drug in Persian works on *Materia Medica*, is a translation of the article on *Chelidonium minus* (Χελιδόνιον μικρόν) of Dioscorides, and as that is supposed to be *Ranunculus Ficaria*, this name was put with a query as a subject for further investigation. Dr. Royle adds, he never supposed that European plants are the sources of Oriental drugs, but he believes that, in numerous instances, European plants have been substituted for drugs which were well known in ancient times, but of which the real sources were unknown. I find in the Catalogue of his collection of Indian drugs, contained in the *Official, Descriptive and Illustrated Catalogue of the Great Exhibition*, part iv., p. 895, three sorts of "*Mahmiran*" mentioned, to only one of which (namely, that from Cashmere) he has doubtfully added "*Ranunculus Ficaria*?"

* Notes on the Drugs called *Mishmee Teeta* and *Pucha-Pat*, by N. Wallich, M.D. In the *Transactions of the Medical and Physical Society of Calcutta*, vol. viii., part 1, page 85. Calcutta, 1836.

Some of the later Greek writers were acquainted with the root called *Mahmira*. Thus Paulus Ægineta † says, that *Μαμπίρα* is a sort of a radicle of a herb, having, as it were, thick knots. Actuarius ‡ also mentions *mamera* as one of the constituents of the "Antidotum Esdræ." Several of the Arabian writers likewise notice *Mahmira*. Thus Avicenna § speaks of "*Memirem*," or "*Mamiran*," and says that the root is abstergent, and cleansing; and declares it to be useful for clearing away albugo of the eye, and improving the eye-sight, for which purpose, he states, it is to be used in the form of a collyrium. Rhazes || also mentions "*Mamiran*." Ibn Baitar ¶ says that "*Mamiran*" is a small kind of yellow root, which is also called "*Uruk*." He also states **, on the authority of Elgáfaki, that *Mamiran* is brought from China, and that its properties are like *Curcuma*.

Although it has been usually assumed that the root here referred to by the Greek and Arabian writers was the produce of *Chelidonium majus*; yet it appears to me to be not improbable that *Coptis Testa* was in reality the parent plant; and *Mahmira* and the *Mishmee Bitter* may be, therefore, identical substances. For, in the first place, we have the identity of the Arabic and Greek names with the name by which it is at present known in Seinde. Secondly, according to Ibn Baitar, "*Mamiran*" came from China. Thirdly, the ancient "*Mamiran*" was a yellow root. Fourthly, both roots were employed in diseases of the eye.

It is probable, however, that the word "*Mamiran*," or "*Mahmira*" is used in the East generically, and that the *Coptis Testa* is one out of several species of it.

The root of *Coptis Testa* has been long known in Europe under another name, and some of the latest European writers on Pharmacology appear to be quite unacquainted with its real origin.

When Professor Guibourt was in London some months since, I showed him a sample of the root, which he immediately recognised as the one he had described and figured †† under the name of *racine de chynlen ou de mangouste*, and which he had ascribed to an apocynaceous plant.

The same root has been described both by Bergius ‡‡ and J. A. Murray §§ under the name of *Chynlen*.

Ainslie ||| also mentions it under the name of "*Sou-line*, or *Chyn-len* (Chinese)," and says that it is a bitter root which is brought to sale from China to India, and he refers to a notice of it given by Virey ¶¶.

The first accurate notice of this root is that given by Dr. Wallich, in the paper before referred to, and whose account I subjoin:—

"*Mishme Teeta* is the name by which the drug is designated among the *Mishmees* and *Lamas*, in the mountainous regions bordering upon Upper Assam. The Chinese call it *Honglane*. Among these three nations it is in great estimation, and in universal use as a powerful tonic and stomachic. Quantities are sent down to Assam in neat little baskets, with open meshes, made of narrow slips of ratan, or some such material, and measuring three to four inches in length by two and a half in breadth and one and a half in width. Each basket contains about an ounce of small pieces of the root, from one to three inches long; they are nearly cylindric, uneven, scabrous, more or less curved, of a greyish brown colour, and varying in thickness from the size of a crow-quill to

† Translation by Dr. Adams (Sydenham Society) vol. iii., p. 289. Dr. Greenhill (Translation of Rhazes's *Treatise on the Small Pox and Measles*, p. 195, 1848. Sydenham Society) says, perhaps, Paulus Ægineta is the earliest Greek writer who uses the word.

‡ Ruellius's Latin version, p. 256. 1546.

§ Canonis; lib. ii., tract. ii., cap. 487., p. 345. Lat. ed. 1564.

|| Dr. Greenhill's Translation. Sydenham Society's ed., p. 195. 1848.

¶ Sontheimer's German version, Bd. ii., S. 487. 1840.

** Ibid., p. 188.

†† *Histoire Naturelle des Drogues Simples*, tome 2me, p. 526. 4me éd. 1849.

‡‡ *Materia Medica*, t. ii. p. 967.

§§ *Apparatus Medicaminum*, vol. vi. p. 153. 1792.

||| *Materia Indica*, vol. ii., p. 400. 1826.

¶¶ *Bulletin de Pharmacie*, t. v., p. 395. 1813.

double that diameter. The root is perfectly dry and brittle; occasionally a few fibrillæ are issuing from one end; the inside is hard, somewhat cellular, the outside of a dingy yellow colour. The taste is intensely and purely bitter, very lasting, and with only a very slight aroma. On mastication, the root tinges the saliva yellow; its interior is bright yellow or gold-coloured. It possesses no smell whatever."

Subsequently he obtained some fresh roots, with leaves, and incomplete specimens of the inflorescence. From these materials he drew up a botanical description of the plant, from which I extract the following specific characters:—" *Coptis Teeta*, foliis trisectis, segmentis petiolatis, lobato-pinnatifidis, lobis incisim acutissime setaceo-serratis; scapo paucifloro bracteis foliaceis linearitripertitis."

The root, as shown by the East India Company at the Great Exhibition, corresponded entirely with Dr. Wallich's description; and was contained in the same little baskets in which he describes it as being sent down from Assam.

No chemical examination has yet been made of this root. Mr. Twining,* who subjected it to a few experiments, says that, "Judging from the taste, it does not possess much astringency; and this opinion is confirmed by finding that neither the tincture nor the infusion is much affected by the solution of sulphate of iron. 280 grains of the root, when coarsely powdered, and macerated in proof spirit for five days, were found to have lost 180 grains. The residue of the above tincture, when dried, amounting to 300 grains, was macerated for 30 hours in distilled water, and only 26 grains were found soluble in water; as the residuum, when dried, weighed 174 grains." The root appears to abound in a yellow bitter principle, soluble in alcohol and water.

The medicinal properties of this root are those of a bitter tonic. It aids in the restoration of the appetite and the promotion of the digestive powers in patients recovering from acute maladies.

It may be given in powder, infusion, tincture, and extract. The dose of the powder is from five to ten grains thrice daily.

ON A

REMARKABLE SPECIMEN OF DECOMPOSED CHLOROFORM.

BY JONATHAN PEREIRA, M.D., F.R.S.,

Physician to the London Hospital.

IN July of the present year I received from Mr. Grattan, Apothecary, of Belfast, a specimen of chloroform, accompanied with a note, from which the following is an extract:—

"Some weeks prior to October 25, 1851, I received from my friend Dr. M'Killen a small bottle of chloroform which he had had of me two or three months previously, and which he stated was subject to very singular changes of colour, despite the stopper never having been removed.

At the time he banded it to me the fluid exhibited a delicate pink tint, as though coloured with cochineal, and was put aside in a glass case in my shop, of which I kept the key myself. The case was exposed to the diffused light of a large shop window, but not to the direct rays of the sun.

Conceiving that the chloroform had by some unobserved means or other become accidentally coloured, I took very little interest in the matter, and was not surprised to find it fade gradually, and in a short time become perfectly colourless—and I made a note to that effect upon the 25th of October, concluding that there must have been some error of observation on the part of Dr. M'Killen.

On the 16th of November, however, it again began to change, and the inclosed notes were made from time to time, as I happened to have opportunity of noticing it.

I tried it under different conditions of light and temperature, without their exerting apparent influence upon it, and being unable to form the slightest conjecture

* In a note appended to Dr. Wallich's paper.

as to the cause or nature of the molecular disturbance which produces these chromatic changes, have taken the liberty of forwarding it to you, should you consider it worthy of attention.

It is at present colourless, and the stopper fast in ; and I would only suggest that, before removing the stopper, it might be well to observe for yourself whether changes similar to those I have noticed may not occur again.

1850.

- Oct. 25. Perfectly colourless
- Nov. 16. Faint pink
- 18. Fading
- 25. Faint pink, as on the 16th
- 26. Dirty-looking neutral tint, without any pink
- Dec. 17. Pink again
- 21. Ditto, and deeper
- 27. Perfectly colourless, after having passed through various shades of pink.

1851.

- Jan. 10. Again pink
- 11. Faint neutral tint
- Feb. 19. Perfectly colourless. On shaking the vial, observed a deposit on its sides, like small crystals, but cannot say that they were not there before.
- 21. Pink and deeper than ever.
- Mar. 10. Deep pink
- 12. Faint ditto
- 13. Colourless

1851.

- Mar. 28. Colourless
- May. 16. Ditto. No change having occurred between the 13th March and 16th May, concluded too hastily that the property of changing its colour, upon whatever cause dependent, had been lost, for on
- 17. It again became faintly pinked
- 19. Deeper pink
- 22. Fading
- 24. Fading
- 31. Colourless
- June 13. Again pink
- 16. Ditto
- 17. Colourless
- July 2. Ditto, up to present date, when it again became pink
- 3. Deeper
- 5. Still very deep
- 7. Fading
- 13. Perfectly colourless

The foregoing changes of colour were not influenced by any change of temperature between 27° and 86° Fahr., nor by exposure to, nor seclusion from light. The stopper being fast, atmospheric pressure cannot have been connected therewith. Whether it may have been influenced by electrical changes, am not prepared to say."

The specimen of chloroform sent me by Mr. Grattan was, in July, quite colourless, and on the sides of the bottle a few minute crystals were observed. The stopper of the bottle was, however, so firmly fixed in, that I could not remove it, and I, therefore, placed the bottle on the mantel-shelf in my library exposed to diffused light, for the purpose of observing the changes which its contents would undergo.

In the course of a few weeks it began to acquire a pinkish or amethystine tint, as described by Mr. Grattan. This slightly augmented in intensity for a few days, and then became somewhat paler. But for several weeks, during which it remained in the same situation, it never became colourless, though the intensity of the colour was frequently changing.

The colour of the liquid was precisely that of a weak solution of permanganate of potash.

Some weeks ago I placed the bottle in a dark cupboard, and at the expiration of about three weeks found that the liquid had become quite colourless. As the stopper was still immovable, I was obliged to cut off the neck of the bottle to get at the contents. I then found that the chloroform had undergone decomposition, and had acquired a powerful and irritating odour, somewhat allied to, but distinct from, that of hypochlorous acid. The vapour yielded white fumes when a rod moistened with solution of ammonia was brought in contact with it, blue litmus paper was reddened but not bleached by it. A few drops of the liquid were placed on a watch-glass and volatilised by a spirit-lamp; they left scarcely any appreciable residue.

The crystals which lined the bottle were then examined. They were few in number and not larger than pins' points. They were white, and when examined

by the microscope, were found to be six-sided pyramids, like the crystals of sulphate of potash. Some of them were heated to dull redness in a test-tube without undergoing any appreciable change. When heated on the point of a moistened thread in the outer cone of the flame of a candle, they communicated a violet-white tinge to the flame, characteristic of a potash-salt. They readily dissolved in water, and the solution did not yield any precipitate on the addition of a solution of nitrate of baryta, showing that the salt was not a sulphate. The solution was boiled with nitric acid, and then treated with a solution of nitrate of baryta, but no precipitate was observed. Nitrate of silver produced in the aqueous solution of the crystals a white precipitate, soluble in ammonia, but insoluble in nitric acid.

Whether these crystals were in any way connected with the change of colour which this sample of chloroform underwent, I am unable to determine; but I suspect not. I am anxious, however, to draw the attention of others to the subject in the hope that larger specimens of the salt may be obtained for examination. For at present the circumstances under which chloroform frequently undergoes decomposition are very obscure. Except in this instance, I have never met with, nor heard of, any sample of chloroform which underwent these remarkable changes of colour.

The chloroform was transferred into another bottle, on the sides of which a few minute crystals are now formed. But since the removal of the stopper the pink colour has not re-appeared.

I have written to Mr. Grattan to obtain, if possible, further information respecting this specimen of chloroform. But he tells me he has not any more of the sample, and has no means of ascertaining by whom it was made, as about the time it was purchased of him he had in his shop parcels from London, Edinburgh, and Dublin, as well as a small quantity prepared in Belfast, and he is quite unprepared to say from which of them it was taken.

I suspect that the pink colour of the chloroform must have been due to the presence of manganese. If so, was this metal derived from the chloride of lime used in the manufacture of chloroform? Mr. Squire informs me that he has occasionally found the solution of chlorinated soda to become of a pinkish hue after being prepared a few days (not immediately), and that he has attributed it to some manganese carried over with the chlorine gas, as he does not remember have observed this change when the gas has been passed through water before entering the solution of carbonate of soda.

If this suspicion should prove well founded, it is obvious that the purity of the chloride of lime employed in the preparation of chloroform deserves the attention of the manufacturer.

Postscript.—Subsequently to the reading of this paper before the Pharmaceutical Society, I have received from Mr. William Huskisson, jun., a specimen of pink chloroform, which, he informs me, owes its remarkable colour to the presence of manganese, derived from peroxide of manganese employed in the purification of chloroform, as recommended by Dr. Gregory (see *Pharmaceutical Journal*, vol. ix., p. 580).

Mr. W. Huskisson, jun., tells me, that he has observed in his specimen neither the alternations of colour nor the crystals met with in the specimen sent me by Mr. Grattan.

The CHAIRMAN stated, that he had never, in the various specimens of chloroform, of which his firm had always a large quantity in stock, observed the pink colour described by Dr. Pereira, nor had he ever seen any crystals deposited in the bottles, but he would have a more minute examination made with the view of ascertaining whether such existed. When the chloroform was first drawn over, and before it was purified, it frequently possessed more or less of a brown colour, but this was quite distinct from the character described in the paper which had just been read.

Mr. D. HANBURY observed, that the use of manganese had been suggested in

the process for purifying chloroform, and its presence might in this way be accounted for.

Mr. BARNES thought it desirable, that the decomposed chloroform should be examined for formic acid. Although constantly subject to decomposition, no satisfactory explanation of the nature of the change had yet been afforded.

ON THE PREPARATION OF SYRUP OF POPPIES.

BY MR. STOCKEN.

THE author, in this communication, directed attention to a process for the preparation for the syrup of poppies, originally suggested by Mr. Thomas Southall, and published in the second volume of the *Pharmaceutical Journal*. He states:—The principal feature in the process consists in the use of cold water, instead of boiling, to extract the medicinal virtues of the poppies.

Mr. Southall's process is conducted as follows:—The capsules, from which the seeds have been separated, are weighed, and then dried, by which they lose from ten to fifteen per cent. They are then bruised and passed through a sieve of three-eighths inch mesh. They are next macerated in a mash-tub, several portions of cold water being added and stirred with them, to ensure the whole being uniformly moistened. About an hour afterwards, the infusion is drawn off from the bottom of the vessel, more water being poured on the surface; after which the infusion is allowed to run off during the day. The quantity of water used is about the same as that which is directed in the *Pharmacopœia*. The infusion is evaporated, as it is drawn off, to nearly the consistence requisite for making the syrup, and allowed to stand during the night. The clear portion is poured off the following morning, the remainder strained through a calico bag, and the sugar is dissolved in the clear liquor, with as much heat as is requisite for the purpose.

I have ventured to deviate from the instructions of Mr. Southall in some points.

1st. As regards the time specified for the poppies to macerate prior to the infusion being drawn off. He occupies a period of about thirteen hours—one hour for maceration, and twelve hours, or a day, for the required quantity to run off. I have extended the time occupied for maceration, from one to twelve hours, and another twelve hours for the infusion to run off.

2dly. As regards the quantity of water to be used, and the period at which the sugar is added to the concentrated infusion. I find that about two-thirds of the quantity of water ordered in the *Pharmacopœia* is sufficient to ensure the exhaustion of the poppies in operating as I have described. In converting the infusion into syrup, I add the sugar before the concentration has been completed, and then evaporate the solution until it indicates a density of 32° by the saccharometer. The advantage of this mode of operating arises from the fact that a quantity of scum is thrown off during the evaporation with the sugar, which would not otherwise be separated, and the syrup is rendered brighter in consequence. Syrup of poppies thus prepared is not only better in appearance than that made according to the instructions of the *Pharmacopœia*, but it is not so liable to undergo fermentation.

In conclusion I may state, that the foregoing experiments have been made with Messrs. Coffey and Smith's steam apparatus, which, for operations on the small scale, has been found to be economical, and to answer exceedingly well.

The CHAIRMAN was glad to find *Pharmaceutical* subjects, such as this, of a practical nature, brought before the Meeting, and had no doubt it would be the means of conveying information, not only to the Members of the Society, but also to the authors of *Pharmacopœias*, which would tend to the improvement of our processes. With regard to the observations of Mr. Stocken, he confessed that he did not agree with him on all points. He thought the resulting syrup was better when the poppy capsules were boiled, and not previously bruised, than when they were treated as had been described, with cold water. The

boiling water extracts more of the true characteristic flavour of the poppy, and if the syrup be made of sufficient density it will not undergo fermentation.

Mr. DEANE had, for the last twelve years, adopted a process for the preparation of syrup of poppies, almost identical with that described by Mr. Stocken, and had always obtained a good result. He found that cold water extracted the whole of the active matter of the poppy, and that the product was less liable to undergo fermentation than when the capsules were boiled. In his process he was accustomed to evaporate the infusion in a vacuum pan. He might further observe, that he had found the addition of a little spirit, as directed in the Pharmacopœia, promote the preservation of syrups.

The CHAIRMAN said, his experience was not favourable to the use of spirit in the preparation of syrups. He thought they kept better without it.

A communication on the subject of ARABIAN and CYPRIAN ALOES, by Dr. X. LANDERER, was read, in which it was stated, that much of the Aloes employed in the East is produced in Arabia, where various species of *Aloë* grow in considerable abundance. The drug is rudely manufactured by the Arabs from the expressed juice, and is then carried to the bazaars of Alexandria, Cairo, Smyrna, &c.

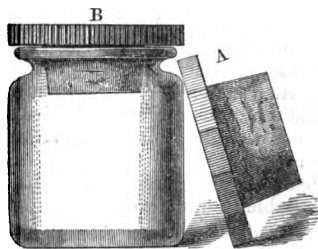
The aloes produced in the island of Cyprus, though excellent in quality, is stated not to be prepared in sufficient quantity to admit of its being exported.

Mr. BENTLEY directed the attention of the Meeting to a leaf and flower of the Victoria Regia, and a rice plant, from the Royal Botanic Gardens, in the Regent's Park.

CORK-STOPPERS WITH WOODEN TOPS.

Dr. PEREIRA drew the attention of the Members of the Pharmaceutical Society to the very convenient compound stoppers in use in Germany and other places. His attention had been especially drawn to them, partly in consequence of having recently received several pharmaceutical substances from Germany, contained in bottles, closed by these stoppers; and partly in consequence of having observed that many of the vegetable and other substances, sent from British Guiana to the great Exhibition (most of which have been presented to the Pharmaceutical Society) were preserved in bottles, closed by this kind of stopper.

These stoppers consist of an accurately turned cork, or bung, surmounted by a flat wooden disk, or top, glued to it. This top is either round (as in fig. B), or polygonal (as in fig. A); and may be either coloured, or covered by paper. It projects beyond the circumference of the cork, and serves as a handle. Its upper surface being flat, is useful for inscribing either the name of the article contained in the bottle; or, when the bottle is used in dispensing, the directions for the use of the medicine.



A. The polygonal compound stopper.
B. A round compound stopper closing a glass jar.

These stoppers are very convenient for closing bottles and jars used in museums, for preserving dry objects of natural history; as fruits, seeds, roots, leaves, &c. They are much lighter than glass stoppers, and are not liable to get fixed, as they may be removed with the greatest facility. Moreover, bottles closed by them, may be placed sideways in a drawer, without incurring the danger of the stoppers falling out.

To the Pharmaceutist, they cannot but be useful and convenient, for the preservation of powders and other dry substances; as well also for dispensing.

Small bottles, closed with these stoppers, may be employed as substitutes for pill-boxes.

The specimens shown by Dr. Pereira to the Society had been received by him from Messrs. Siemens and Co., of Hamburg, who sold the bungs, or simple stoppers, and the tops separately; as well as in the united state, forming the compound stopper. By purchasing the bungs and tops separately, a saving is said to be effected in the duty.

They are sold by the hundred. Compound stoppers with coloured tops cost from 54 to 496 schillings (= from about 4s. to £1 16s. 2d. British money) per 100. Compound stoppers with tops covered by coloured paper cost from 75 to 595 schillings (= from about 5s. 6½d. to £2 3s. 4d. British money) per 100. The sizes of the stoppers here referred to vary according to price, from half-an-inch to about three-and-a-half inches in diameter.

A MEMBER stated that compound stoppers, similar to those described by Dr. Pereira, were extensively manufactured by Mr. Gilbertson, of Ludgate Hill, London.

LIST OF MEMBERS, ASSOCIATES, AND APPRENTICES (*continued*).

Elected in September, October, November, and December.

MEMBERS.

BRADNINCH	Tatham, Leonard F.	
CANTERBURY	Hall, John, Richard	Mercery Lane
HOLYWELL	Turner, Frederick E.	High Street
LEEDS	Haigh, Joseph	116, Briggate
LENTON	Grundy, Edwin	Willoughby Street
LONDON	Sims, John F.	8, New Chapel Place, Kentish Town
	Urwick, William W.	33, Denbigh Place, Pimlico
MELESHAM	Mundy, Walter	High Street
NORWICH	Row, Frederic	St. Stephen's Street
PUTNEY	Harwood, John	High Street
SHAFTESBURY.....	Rutter, Clarence	High Street
STOWMARKET.....	Jackson, William.....	Market Place
TROWBRIDGE	Roberts, Edwin.....	

MAJOR EXAMINATION.

Joy, Francis William	Clapham
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MINOR EXAMINATIONS.

Boorne, Charles	Newbury
Parkinson, Robert	Croydon
Pitman, Edward	Birmingham
Régnaud, Charles.....	Mauritius
Skrimshire, Thomas	London
Smith, Samuel A.	Manchester

REGISTERED APPRENTICES.

APPRENTICES.	RESIDING WITH	TOWNS.
Adcock, Herbert B.	Mr. Stamper	London
Anthony, John L.	Mr. Anthony	Bedford
Beale, William F.	Mr. Beale	London
Danson, Smith H.	Mr. Stutchbury	Demerara
Dickinson, R.	Mr. Dickinson	London
D'Oyle, John	Mr. Pasmore	London
Duncan, John M.	Mr. Lavers	Lewisham
Frost, George	Mr. Parker	Derby
Green, Robert	Mr. Knott	Exeter
Green, Charles F.	Messrs. Farmer & Co.	Worcester
Harvey, Sidney.....	Messrs. A. & W. Hemingway	London
Hill, William.....	Mr. Rowe.....	Plymouth

APPRENTICES.	RESIDING WITH.	TOWNS.
Jenkins, Edward	Mr. Grounds	Ludlow
Lawrence, George	Mr. Wilson	Berwick
Long, Henry	Mr. Rouse	London
Nosworthy, Robert	Mr. Husband	Exeter
Oliver, James	Mr. Smith	Tenterden
Ridley, Horace	Mr. Harrington	Rochford
Ruston, Thomas	Mr. Stephenson	Whisby
Sidford, James	Messrs. Farmer & Co.	Worcester
Thomas, John	Mr. Brand	Swansea

BIRMINGHAM PHARMACEUTICAL INSTITUTION.

The Fourth Anniversary was held at the Philosophical Institution, Cannon Street, on Friday evening, December 12th.

The Members and their friends began to assemble at half-past seven o'clock. They spent the first hour in taking tea and coffee, and in inspecting the various objects of scientific interest, that were collected for their entertainment. There were some fine specimens of drugs, chemicals, and minerals, exhibited in the room where the Meeting was held; there was also an excellent microscope, with which several of the starches, met with in commerce, were shewn; and the Meeting had access to the Geological Museum, belonging to the Philosophical Institution.

The chair having been taken by the President, Mr. Jos. Leay, he opened the business of the evening with a few appropriate observations, expressing his gratification at meeting so large an assembly on this the Fourth Anniversary of the Society. He then called upon Mr. Wilcox, one of the Secretaries, to read the Report of the Committee.

The Report stated, that the Meetings held during last winter, had shewn an improvement over former years, in point both of interest and attendance; it likewise stated, that many valuable works had been added to the Library. But, in some respects, the Committee were unable to present so satisfactory a Report as they could have wished.

A course of Lectures on Materia Medica, had been delivered by Professor Knowles, which it was hoped, from the practical nature of the subject, would have obtained a large class, and that the fees would have been nearly sufficient to cover the expenses; but the number of Students who entered was so small, that there remained a large deficiency to be made up out of the Lecture Fund. There had been a slight falling off in the amount of subscriptions; but still, the accounts showed a balance in hand of rather more than £2.

Mr. BRID proposed, "That the Report of the Committee be received and adopted." He expressed his regret that the Institution had not been more generally supported. It was a little Institution, but he felt it to be of great importance; it offered to the young men facilities for study and improvement, which he should have been glad to have availed himself of when he was learning his business; but nothing of the kind existed then. The Library, he considered, a very good collection of modern works on Chemistry and Pharmacy.

Although the Society had some discouragements to contend with, there were those connected with it who were determined it should not die. He called upon every Member to come forward, and aid in carrying it on with spirit and energy. The Committee were, individually, willing and anxious to do all they could, and would feel encouraged, as well as assisted, by the co-operation of others.

Mr. W. SOUTHALL, seconded the reception and adoption of the Report. With respect to the Lectures and Meetings, he was very desirous that they should be kept up with spirit, and hoped a better attendance would indicate their increasing interest. Mr. SOUTHALL considered the Library particularly worthy of

attention, he believed it had already been serviceable, although the number of volumes it contained was very limited. He suggested that as much of the funds as could be spared should be applied to its increase. In conclusion, he referred to the Act of Parliament, which was in contemplation, for compelling Chemists and Druggists to qualify themselves for their business. He urged the young men to improve their education whilst they had the opportunity of doing it, voluntarily, as the appearance would then be much better than if they waited for compulsion. He looked forward to the time, and that not far distant, when Pharmaceutical Chemists will be much better informed than they are at present.

The resolution was carried unanimously.

Mr. CATTELL proposed, and Mr. CHARLES F. PALMER seconded the following gentlemen as Members of the Committee for the ensuing year, in place of the six who retire by rotation:—Mr. W. Southall, Mr. Knight, Mr. W. Southall, jun., Mr. J. Horncastle, Mr. Adcock, and Mr. T. Scott. The motion was carried unanimously.

Mr. JOHN SUMNER moved "That Mr. Foster and Mr. C. F. Palmer be the Auditors of Accounts for the ensuing year."

Mr. HORNCASTLE, on seconding the motion, stated that the small amount of the balance in hand, which had already been remarked upon, did not indicate that the General Fund of the Institution was in a much worse position than last year. The chief deficiency had occurred in the fees to the Lectures on *Materia Medica*, in consequence of which a large draught had been made upon the Lecture Fund, which having been established for a special object, was not applicable to the general purposes of the Institution.

The motion having been put and carried, J. B. HAYES, Esq., M.R.C.S., moved the next resolution.

Resolved—"That the Birmingham Pharmaceutical Institution is well worthy the support of Chemists and Druggists, seeing that it must have a direct tendency to improve the knowledge of their Assistants and Apprentices, and thereby to enable them to render their employers more efficient services."

Mr. HAYES said that verbally the resolution he had read would receive the acquiescence of all present; but to render it effectual something more than a mere verbal assent was required; the Members individually must assist in the business of the Institution. He then alluded to the opportunities possessed by Chemists and Druggists for cultivating the several branches of science, which are constantly involved in their avocations. Many had been distinguished for high scientific attainments, and as a body they would in future have to occupy a very different position to that which they now occupy. He understood the object of this Institution to be to educate the young Chemists and Druggists.

Mr. HAYES then entered upon the consideration of the manner in which education was to be effected, and in the course of his remarks offered some valuable suggestions. The practice of Pharmacy must be learnt at home, in the shop and the laboratory, its theory would be learnt from lectures. Lectures should not be of a desultory character, that is to say, they should not at one meeting be on this subject, and at the next upon a subject entirely disconnected. Each subject should be completed before another is taken up.

The operation of this Society should be suggestive and directive; it should point out to young men the course of study it would be most advantageous for them to pursue. As it was not intended to pay lecturers, Mr. Hayes advised that a portion of the funds should be applied for the purchase of apparatus which might be at the service of any Member of the Society on application, or which would be useful for illustrating lectures. To the young men he said if they would attain the position their seniors now occupy, it was necessary they should make good use of the opportunities offered to them.

T. W. WILLIAMS, Esq., M.R.C.S., said the resolution which had been moved by Mr. Hayes was something more than a mere form of words; it implied that all who approved of it would do something to promote the objects of this Society. Amongst Chemists and Druggists there were three classes:—

1st. The seniors, who were advanced in life, and had been a long time engaged in business:—These had been found the most active supporters of the Institution.

2ndly. Young men who were just commencing business on their own account.

3rdly. Apprentices.

Now, what part should each of these classes take? The seniors had been found the most active, but it could not properly be expected that they should undertake laborious offices; they would contribute to the funds; but, the working of the Institution must devolve upon the second class; and the third class will be the students, of whom the most industrious will be likely afterwards to take the lead in their business.

It is the duty of masters to instruct their apprentices, and to afford them every facility for pursuing their studies. Any master who is negligent of, or unqualified for, the duty of educating his Apprentice, is guilty of obtaining money under false pretences.

To learn the business of a Chemist and Druggist is a very different matter to learning that of a draper or grocer. A young man may become fully qualified for either of the latter without seeing any book but the day-book and ledger; but he cannot qualify himself as a Chemist and Druggist without extensive reading. New discoveries are continually being made, and new medicines brought out; and whom should we expect to be soonest acquainted with them? Medical men cannot always be acquainted with them; often they have not the opportunity even of seeing new medicines; they naturally look to the Chemist and Druggist, whose especial province it is to be fully informed upon all such matters. It is of the greatest importance, too, that he should be qualified to pronounce, whether the articles supplied to him, and which he dispenses to the public, are really what they are represented to be.

Mr. WILLIAMS considered it of much greater importance to train up good Pharmaceutical Chemists, than to train up philosophical Chemists. The Birmingham Pharmaceutical Institution is but a young Society; and, therefore, must not despair, if it finds some difficulties to contend with. Mr. Williams instanced the experience of some other societies to encourage the Members to persevere in the undertaking they have commenced.

Dr. NELSON cordially supported the Institution in all its objects and views. At the last Anniversary Mr. Bell had addressed them, and urged the advantage of obtaining an Act of Parliament to unite the Chemists and Druggists into a general society for controlling education, and examining those who enter their profession. Dr. Nelson fully approved of this proceeding. There were cases of slight indisposition in which people could not be induced to apply to a medical man, and if the Chemist and Druggist were prevented from administering medicines in such instances, it would only give rise to another class who would exercise that right. It was important, however, that the Druggists should know the responsibility they incurred; for this reason Dr. Nelson desired to see an improvement in their education, for the man who had little knowledge would undertake cases which one who was better informed would know should receive the attention of superior skill.

The Meeting expressed its unanimous approval of the resolution in the usual manner.

After the conclusion of business Mr. ALFRED BIRD exhibited some interesting experiments with a powerful Electro-Magnet.

A vote of Thanks having been passed to Mr. Bird and to the Chairman, the Meeting separated.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE USE OF SULPHOCYANIDE OF AMMONIUM AS A TEST FOR SALTS OF IRON.

(From a Correspondent).

On testing some nitric acid with sulphocyanide of ammonium, and finding that the liquid acquired a blood-red colour, I naturally supposed that the acid contained some salt of iron; to confirm this supposition, ammonia was added in excess, and sulphuretted hydrogen transmitted, but no trace of iron or other metal could be detected, the liquid remaining perfectly colourless. As it is generally stated that sulphocyanides exceed in delicacy all other tests for iron, I was at a loss to know whether a trace of iron might not be present too small to be discoverable by other reagents. This question was at last satisfactorily settled by boiling the red acid mixture until the red colour had disappeared, and red fumes ceased to be evolved, and when cool, adding a fresh portion of sulphocyanide, which was found to produce no colour whatever. It thus became evident that the colour did not arise from the presence of iron, but apparently from that of peroxide of nitrogen (NO_2) which was therefore evolved in a separate vessel, and transmitted through a solution of pure sulphocyanide of ammonium. The instant the gas reached the surface of the liquid, the red colour was produced. For the same reason, anything capable of decomposing nitric acid in the cold, and abstracting one atom of oxygen, such as sulphurous or hydrochloric acid, produces the same effect when added to a colourless mixture of nitric acid and sulphocyanide of ammonium. Since nitrous acid (NO_2) evolved by the action of acetic acid on nitrites, is generally believed to undergo decomposition into nitric oxide (NO_2) and peroxide of nitrogen (NO_4) I expected to find the red colour produced by boiling fused nitrate of potash with acetic acid, and a sulphocyanide; but although red fumes were visible above the mixture, no colour was produced in the latter. On adding nitric acid to the cold mixture the expected result was immediately produced. From this it is evident that in the first case nitrous acid (NO_2) was evolved unchanged, and has no power of reddening sulphocyanides; but in the latter, nitric and nitrous acids mutually decompose each other, peroxide of nitrogen being the result ($\text{NO}_2 + \text{NO}_2 = 2 \text{NO}_4$). This forms a ready method of distinguishing nitrites from nitrates. If NO_4 be transmitted through ammonia, the contrary effect is produced, nitrite and nitrate of ammonia being formed, so that no colour appears on boiling with acetic acid and sulphocyanide. It now remains to distinguish between the colouration caused by peroxide of nitrogen and that by persalts of iron.

One method by boiling the mixture has already been mentioned, and is probably the most easy and certain, or else alcohol may be added to the cold solution, which removes the colour arising from peroxide of nitrogen, but not that from persalts of iron; nitrate of urea would probably produce the same effect.

Although these reactions must have been observed by others, I can find no mention of them in any Chemical work; on the contrary, I have been surprised to find it stated "that salts of iron are indicated by sulphocyanides with the greatest possible precision; the red colour produced being highly characteristic."

Bristol.

SELECTIONS FROM THE RECORDS OF THE BENGAL GOVERNMENT,
ON THE SYSTEM OF CULTIVATING THE POPPY AND OF PREPARING
OPIUM IN THE BENARES OPIUM AGENCY ;

With a Brief Sketch of the Constitution of the Department.

BY W. C. B. EATWELL, M.D.

(Continued from page 271.)

THE lands selected for poppy cultivation are generally situated in the vicinity of villages where the facilities for manuring and irrigation are greatest. In such situations and when the soil is rich, it is frequently the practice with the cultivators to take a crop of Indian corn, maize, or vegetables off the ground during the rainy season, and after the removal of this in September, to dress and manure the ground for the subsequent poppy sowings. In other situations, however, and when the soil is not rich, the poppy crop is the only one taken off the ground during the year, and from the commencement of the rains in June or July until October, the ground is dressed and cleaned by successive ploughings and weedings, and manured to the extent which the means of the cultivator will permit. In the final preparation of the land in October and November, the soil, after being well loosened and turned up by the plough, is crushed and broken down by the passage of a heavy log of wood over its surface, and it is in this state ready for sowing.

The amount of produce from various lands differs considerably. Under very favourable circumstances of soil and season as much as 12 or even 13 seers (26 lbs.) of standard opium may be obtained from each beegah of 27,225 square feet. Under less favourable conditions the out-turn may not exceed three or four seers, but the usual amount of produce varies from 6 to 8 seers per beegah.

The chemical examination, of different soils in connection with their opium producing powers, presents a field for very profitable and interesting enquiry; nor is the least important part of the investigation that which has reference to the variations in the proportions of the alkaloids (especially the morphia and narcotine) which occur in opium produced in various localities. That atmospheric causes exert a certain influence in determining these variations is probable: that they influence the amount of produce and cause alterations in the physical appearance of the drug are facts well known to every cultivator. Thus, the effect of dews is to facilitate the flow of the juice from the wounded capsule, rendering it abundant in quantity, but causing it at the same time to be dark and liquid. An easterly wind (which in this part of the country is always concomitant with a damp state of atmosphere) retards the flow of the juice, and renders it dark and liquid. A moderate westerly wind, with dew at night, form the atmospheric conditions most favourable for collections, both as regards the quantity and the quality of the exudation. If, however, the westerly wind (which is an extremely dry wind) blow violently, the exudation from the capsules is sparing. Whilst the effects of the meteorological phenomena in producing the above results are well marked, their action in altering the relative proportions of the chemical constituents of the juice of the poppy plant is more obscure, and it is highly probable that the chemical composition of the soil plays a most important part in this respect. Dr. O'Shaughnessy is certainly the most accomplished chemist who has ever in this country turned his attention to the subject, and he has published the results of his analysis of specimens of opium from the different divisions of the Behar agency, which are worthy of much attention. In the opium from eight divisions of the agency, he found the quantity of morphia to range from $1\frac{1}{2}$ grains to $3\frac{1}{2}$ grains per cent. and the amount of the narcotine to vary from $\frac{1}{4}$ grain to $3\frac{1}{2}$ grains per cent. the consistence of the various specimens being between 75 and 79 per cent. In the opium from the Hazareebaugh district (the consistence of the drug being 77) he found $4\frac{1}{2}$ per cent. of morphia and 4 per cent. of narcotine, whilst from a specimen of Patna garden opium he extracted no less than $10\frac{1}{2}$ per cent. of morphia and 6 per cent. of narcotine, the consistence of the drug being 87. With respect to this last specimen, Dr. O'Shaughnessy mentions that the poppies which produced it were irrigated three times during the season, and that no manure was employed upon the soil.

It is much to be regretted that these interesting results were not coupled with an analysis of the soils from which the specimens were produced, for to chemical variations in it must be attributed the widely different results recorded above.

The climate in which the Patna garden opium was produced (and which is equal in narcotic excellence to the best opium of Turkey or Egypt) was precisely the same as that in which the comparatively poor specimens of the eight divisions above alluded to, were collected, and therefore could not have exerted any influence in producing the chemical differences which the drug from the different localities presented.

The poppy cultivated in the Benares and Behar agencies is exclusively the white variety (*papaver somniferum album*).

In situations favourable to its growth, it vegetates luxuriantly, attaining usually a height about four feet. The stem is branched, and is terminated by from two to five ovate-globose capsules, averaging in size a duck's egg. The plant takes about three months and a half in reaching maturity, and the time for its cultivation is exclusively the cold season, extending from November to March.

It has been found advantageous to change the seed employed in the different divisions every two or three years, and there are certain districts which produce seed of generally acknowledged superiority, and from which the supplies are therefore drawn, and distributed to the cultivators of distant agencies.

The soil having been prepared in the manner described above, the sowing is effected by throwing the seed broad-cast over the land, and this takes place between the 1st and 15th of November.

In three or four days the plough is again passed over the land to bury the seed; and the soil is afterwards again levelled by means of the log of wood before alluded to. The whole surface is then divided into square compartments, the sides of which are about ten feet in length, and are raised and converted into little channels for the purpose of irrigation. The number of times the plant may require irrigation depends in a great measure upon the nature of the season; if some heavy showers fall in December, January, and February, two irrigations may be sufficient; whereas, if the cold season pass over with little or no rain, the operation may be required to be repeated five or six times.

Ten or twelve days are sufficient for the germination of the seed, and after the little plants have attained a height of two or three inches, they are carefully weeded and thinned.

In its progress towards maturity the poppy plant is liable to injury in various ways. It may be nipped by unusually severe frosts, or the plant may become stunted and never fairly reach maturity, owing to the first sowings failing and subsequent late ones being required, or owing to unusual heat and deficient moisture. Portions of cultivation sometimes droop and wither from causes which are not obvious, or are attacked by blight; and finally, considerable injury is frequently inflicted upon the poppy plants by a parasitical species of broom rape (the *Orobanche India*) which attaching itself to the roots of the plants causes them to wither.

In February the plant is generally in full flower, and towards the middle of the month and just before the time for the fall of the petals, these latter are all carefully stripped off and collected. They are then formed into circular cakes from ten to fourteen inches in diameter, and about $\frac{1}{8}$ of an inch in thickness.

The manner in which these leaf cakes are formed is the following: A circular shallow earthen vessel is heated to the requisite degree, by being placed inverted over a slow fire. A few petals are then spread upon its heated convex surface, and as soon as the glutinous juice which they contain is seen to exude, others are added to the moist surface and are pressed down by means of a cloth.

As soon as these latter become moist in turn, they receive a similar addition of petals, and in this manner the cake is extended circularly by successive and continuous additions, until it has reached the required dimensions. Instead of the earthen vessel, a shallow or nearly flat iron cooking utensil is sometimes used.

The cakes of petals (known in the department under the name of "leaves") when they reach the sudder factory at Ghazee-pore, are carefully sorted and separated into three classes according to their size and colour.

The smaller and dark-coloured "leaves" are used in forming the inner portions of the shells of the opium cakes, whilst the largest and least discoloured ones are kept for furnishing their outside coverings.

In a few days after the removal of the petals the capsules have reached their utmost state of development when the process of collection commences, which extends from about the 20th of February to the 25th of March.

The mode of collecting the juice is the following:—At about three or four o'clock

in the afternoon individuals repair to the fields and scarify the poppy capsules with sharp iron instruments called *nušturs*.

The *nuštur** consists of four narrow bars of iron, each of which is about six inches in length, and of about the thickness of the blade of a pen-knife. At one extremity, each bar does not exceed a quarter of an inch in breadth; but it gradually expands, until it has acquired the breadth of about one inch at the opposite end, where it is deeply notched. The sides of the notch are somewhat curved and ground to sharp edges, and the external angles are brought to sharp points. The four little bars, being placed side by side, are bound firmly together by means of strong cotton thread; and the points, at their cutting extremities, are kept separated from each other, to the extent of about $\frac{1}{4}$ of an inch by means of the cotton thread which is passed between each pair of contiguous blades. Thus prepared, the instrument presents four pair of curved, pointed, diverging blades, somewhat similar in shape to the lancet blades of a cupping scarificator.

In employing the *nuštur*, only one set of points is brought into use at a time, and the capsule is scarified longitudinally from its base to its summit, the incisions generally passing more or less along one of the longitudinal eminences, observable on the outside of the capsule, which mark the attachment of the internal dissepiments. The scarifications thus made are very superficial, and do no more than traverse the thin pericarp of the capsule.

If a horizontal section be made of the capsule of a vegetating poppy plant, the milky juice will after a few seconds be perceived to exude first and in greatest quantity from those portions of the sarcocarp which correspond to the bases of the dissepiments. It does not however exude only from these points, but ultimately from the entire surface of the cut sarcocarp. It moreover does not appear in dots as if poured out from longitudinal vessels, but exudes gradually from the meshes of the cellular tissue. If a thin segment of the capsule be examined under a high magnifying power, no longitudinal vessels are observable, but a confused mass of cellular tissue is observed occupying the interspace between the epicarp and endocarp, and opposite to the duplicatures of the endocarp, which go to form the dissepiments, the meshes of the cellular tissue are perceived to be much larger than in other situations, hence the free exudation of juice at these points. It therefore appears that the mode of making the scarifications as actually practised is the most effectual that could be adopted. Each capsule is scarified from two to six times, according to its dimensions; an interval of either two or three days being allowed after each operation.

The capsules having been scarified in the manner above described, the collection of the juice is made at an early hour in the following morning. This is effected by means of instruments called *seetooahs*, which are made of sheet iron, and resemble concave trowels, and with these the juice is scraped from the surface of the scarifications, until the instruments become filled, when their contents are emptied into an earthen pot which the collector carries by his side.

After the plant has ceased to yield any more juice, its utility is still unexhausted. The capsules are then collected, and from the seeds an oil is extracted, which is used by the natives for domestic purposes, both for burning in lamps, and for certain culinary purposes. Of the entire seed a comfit is made, resembling in appearance caraway comfits. Of the dry cake remaining after the extraction of the oil, a coarse description of unleavened bread is sometimes prepared by the very indigent, or it is given to cattle, or used medicinally for poultices.

The capsules, deprived of their seeds, are still available for preparing emollient and anodyne decoctions, which the natives use both internally in coughs, and externally as fomentations. The stems and leaves are left standing, until they have become perfectly dry, under the influence of the hot winds of April and May, when they are removed, and crushed and broken up into a coarse powder, known, in the department, under the name of "poppy trash," and which is employed in packing the opium cakes. When fresh collected, the juice from the capsules presents the appearance of a wet granular mass, of a pinkish colour, and in the bottom of the vessel which contains it, is found collected a dark fluid, resembling infusion of coffee, to which the name of *pussewah* is given. The recent juice reddens strongly litmus paper, and acts rapidly upon metallic iron, covering it speedily with an inky crust of meconate of iron. The juice, when brought home by the cultivator, is placed in a shallow earthen vessel, which is tilted to such a degree, that all the *pussewah* can drain off, and this plan is persevered in so long as any thing fluid will

* Figured page 207.

separate. The pussewah obtained by this means is set aside in a covered vessel, and receives no further attention until taken for weighment to the Ghazee pore sudder factory.

The opium now requires frequent attendance on the part of the cultivator. It is daily exposed to the air, though never to the sun, and is regularly turned over every few days, in order to ensure an uniform dryage in the whole mass; and this process is persevered in for the space of three weeks or a month; or, in fact, until such time as the drug may have reached within a few degrees of standard consistence. Standard opium, according to the Benares regulations, is opium, which, on being subjected to a temperature of 200° Fah. until every thing volatile is driven off, shall leave a residue of 70 per cent. This is the consistence at which the agency puts up the drug for the market, every effort being made to adhere to it, as strictly as possible, and this is likewise the standard by which the price paid to the cultivators is regulated. If the cultivator deliver his drug of standard consistence, he receives for it the regulated price: if it be above standard, he receives a pro rata increase of payment; whereas, if it be below standard, he is subjected to a corresponding deduction in price.

The opium in its arrival at the Ghazee pore factory, is turned out of the confined earthen pots in which it is received, and is weighed in wide tin vessels called tagars, care being taken that no larger quantity than 10 seers (20 lbs.) is ever brought to the scale at a time. This weighment is made under the eye of the gomashita (or of his accredited agent) of the kotee to which the opium belongs, and in the case of the neighbouring or "home" kotees the cultivators attend in person with their produce.

This weighment is verified by an European officer stationed at a check-scale in another room, and the tagar with its contents passes on at once to a table at which are seated the opium examiner, or an experienced sub-deputy agent, and the native opium examiner, called the purkhea.

The purkhea now plunges his hand into the centre and to the bottom of the drug, stirs it about, and grasps it in various directions to feel for impurities, and then withdraws a handful, which he manipulates between his fingers, revealing its colour, texture, and mode of fracture, and finally ascertains its aroma.

He then throws upon a plate a small portion as a specimen, and estimates its consistence. This estimate is written down on a ticket by the European officer, and it is sent with the specimen to the laboratory, where a fixed weight of drug is accurately weighed, evaporated to dryness in a plate placed on a metallic table heated by steam, and the weight of the residue carefully determined. It rarely happens that the purkhea's guess differs from the actual assay by more than one or two grains, and it serves to check the actual assay in cases of evident mistake or accident, which occasionally must occur when a multitude of delicate operations are rapidly carried on. The number of specimens which leave the examiner's table daily, amounts to little short of two thousand. In the examination which the drug undergoes at this stage, the quantity of pussewah which it may contain is made the subject of special remark; and a pussewah fine or batta, as it is termed, is levied, proportionate to the quantity apparently present in the drug. The reason for this is, that pussewah injures the physical qualities of opium, causing it to look black and liquid, whilst at the same time it gives to the drug a high assay when tested by evaporation.

The *tactus eruditus* possessed by the purkhea is very remarkable, he rarely fails to detect even small quantities of the grosser and more tangible impurities, whilst he is no less delicately alive to the slightest variations in colour and smell. In the event of a specimen appearing to be adulterated, it is at once set aside to be carefully examined by the opium examiner, who makes a special report respecting it for the information of the agent, who, should he see sufficient grounds for doing so, confiscates it, when the whole of the drug is destroyed, and the cultivator gets nothing for it. Should the adulterations be less extensive, and the drug such as to be not altogether useless, it is taken at half price, or is subjected to such smaller penalty as the examining officer may think fit to inflict; and it is employed in making the lewah, or paste, used in forming the shells of the opium cakes. The great probability of detection, and the risk of confiscation, act as very efficient checks to the prevalence of adulteration, and the quantity of opium confiscated yearly, is comparatively small. The nature of the adulterations practised by the cultivators is very various.

The grosser impurities usually mixed with the drug to increase its weight are mud, sand, powdered charcoal, soot, cow-dung, pounded poppy petals, and pounded

seeds of various descriptions. All of these substances are readily discoverable in breaking up the drug in cold water, removing the soluble and lighter portions of the diffused mass by decantation, and carefully examining the sediment. By this means impurities of the above nature usually become physically apparent. Flour is a very favourite article of adulteration, but is readily detected; opium so adulterated speedily becomes sour, it breaks with a peculiar short, ragged fracture, the sharp edges of which are dull, and not pink and translucent as they should be; and, on squeezing a mass of the drug after immersion in water, the starch may be seen oozing from its surface. The application of the iodine test, however, furnishes conclusive evidence of its presence, or at least of that of some amylaceous compound. The farina of the boiled potatoe is not unfrequently made use of; ghee, and goor (an impure treacle) are also occasionally used, as being articles at the command of most of the cultivators. Their presence is revealed by the peculiar odour and consistence which they impart to the drug. In addition to the above, a variety of vegetable juices, extracts, pulps, and colouring matters, are occasionally fraudulently mixed with the opium; such are the inspissated juice of the common prickly pear (*Cactus dillenii*), the extracts prepared from the tobacco plant (*Nicotiana tabacum*), the *Datura stramonium*, and the Indian hemp (*Cannabis Indica*), &c. The gummy exudations from various plants are frequently used; and of pulps, the most frequently employed, are those of the tamarind, and of the bale fruit (aegle marmelos). To impart colour to the drug, various substances are employed, as catechu, turmeric, the pounded flowers of the morwa tree, (*Bassia latifolia*), &c.

In the case of so complex a substance as opium, it is useless to look for a single test which shall reveal at once, with chemical precision, the purity of the drug; morphimetry would be the most accurate test to put in force, but the process would be too tedious and expensive to be of practical utility. Moreover, the colour, aroma, and texture are the commercial criterions of the excellence of the drug, and opium, rich in morphia, but deficient in the above qualities from careless preparation, would probably be regarded with suspicion in the market, despite its intrinsic narcotic excellence; and for this reason, whenever the drug is received deficient in the above sensible qualities (as sometimes arises from careless treatment) but not adulterated in any way, it is subjected to a certain fine, and employed only in making lewah. The colour of well-prepared opium is a deep dull brown when viewed in mass, which becomes a bright chestnut brown when a small portion of drug is spread in a thin layer upon a white surface. It adheres to the fingers and draws out to a moderate extent, breaking with a ragged fracture; should it, however, contain much *pussewah*, its ductility is much increased, and it is more glutinous.

Its smell is peculiar, and perfectly *sui generis* it is not unpleasant, and in the recent well-prepared drug somewhat fruity. In cold water it breaks down readily into curdy flakes of the colour of pease soup, which gradually subside, leaving the supernatant liquid of a deep brownish-yellow colour. When broken under water by the hand the drug adheres moderately to the fingers at first, but is soon entirely diffused. Should it contain gum fraudulently mixed, this latter adheres pertinaciously to the hands, and is with difficulty removed, and in this manner I have frequently detected the presence of a substance similar to birdlime, probably the tenacious juice of the banyan tree (*Ficus Indica*). If to a portion of the cold watery infusion in a test-tube, a few drops of a solution of diacetate of lead be added, a dirty grey precipitate (meconate of lead) falls, so copious as to equal nearly in bulk the amount of fluid in the tube. Ammonia throws down a very similar and almost equally abundant precipitate, composed of resin and the alkaloids, which, on exposure to the air, speedily assumes a black colour. Tincture of iodine throws down a brick-red precipitate, and tincture of sesquichloride of iron occasions a similar precipitate of somewhat darker colour. These tests may be applied in a few seconds, and the comparative bulk of the precipitates thrown down may enable us to form a rude estimate of the amount of opium contained in a given specimen. In very largely adulterated specimens, the evidence afforded by the above means is sufficiently marked. A solution of gelatine for the detection of tannic acid, and strong alcohol for the precipitation of gum, form the only other chemical reagents likely to be required.

After having been duly weighed into store, the opium receives but little treatment in the factory. It is kept in large wooden boxes, capable of containing about 14 mds. (10 cwt.) each, in which it is (if below the manufacturing standard) occasionally stirred up from the bottom, until it has acquired the necessary consistence.

Whilst remaining in these boxes it speedily becomes covered with a thin blackish crust (ulmine) and deepens in colour according to the amount of exposure to air and light which it undergoes. Should the drug be of very low consistence, it is placed in shallow wooden drawers, instead of in boxes, in which it is constantly turned over, until its consistence has approximated to 70 per cent. From the general store or malkhana, the drug is exported daily in quantities equalling about 250 maunds, for the purpose of being manufactured or made up into balls or "cakes," as they are termed in the department.

In exporting opium for this purpose, the officer who performs the duty selects for the most part opium, which is exactly at standard, or very close to it, whilst to compensate for any drug which may have risen higher than the prescribed consistence, a certain proportion of opium of low consistence is exported, the consistences of the various proportions of drug selected for export being determined by a certain number of test assays. The portions of drug thus selected are then weighed out with exactitude, in portions of 10 seers (20 lbs.) each, and are thrown promiscuously into shallow wooden drawers, in which men mix them up together, rapidly and thoroughly thrusting their arms into the drug and kneading it in various directions. From these drawers the opium is transferred as mixed to boxes, all of which are of the same size, and from each of which a specimen is drawn and assayed. The mean of the assays of these boxes, gives the average consistence of the export of the day, and serves as a guide, as to whether the drug be of the proper consistence for caking. The above operations are generally completed by about 4 P.M., and before evening the drug is removed from the boxes to large wooden vats, 20 feet long, 3½ feet wide, and 1½ feet deep, situated in the caking room. In these vats it undergoes a further kneading and admixture, by men who wade kneedeep through the opium, from one end of the vats to the other, until their contents appear to be of uniform consistence. Two specimens are, on the following morning, drawn from each vat, and assayed; and should the consistence have reached the factory standard, caking immediately commences.

(To be continued).

NOTICE OF A MICROSCOPIC VEGETATION WHICH ATTACKS CRYSTALLIZED SUGAR.

BY M. PAYEN.

DURING the summer of the year 1843, a remarkable alteration took place in crystallized sugar, both raw and refined, in several of the sugar refineries of Paris.

This alteration was characterized by a reddish colouration, and by small cavities disseminated in irregular longitudinal striæ, which changed the appearance of the white sugars, and rendered them unsaleable.

I discovered that the cause of the deterioration of the sugar was a cryptogamic vegetation, the sporules of which are extremely small.

Two coloured figures of this vegetation are given in plate 1, of the memoir which I had the honour of presenting to the Academy, in conjunction with M. de Mirbel, in February, 1845, and which is inserted in Vol. XX. of the *Mémoires*.*

This year an analogous change, but without the reddish colouration, was observed during the same season, by M. Bayvet, in his refinery. A few days after being removed from the stove, the sugar-loaves, which, until then, were scarcely touched with greyish points, presented, instead of a smooth, crystalline, white, and brilliant surface, a dull appearance, and rough surface; here and there were small indentations (irregular, but not disposed in striæ) of about from 2 to 4, or even 5 millimetres in depth.

M. Bayvet forwarded to me two specimens from these sugar-loaves, one cut from the top, and the other taken from the base of the cone.

On placing, under the microscope, a few particles of detached crystals, taken from the bottom of these small cavities, I ascertained that, in all the portions of the surface of the sugar which were affected, there existed a cryptogamic plant, resembling that observed in 1843, with the exception of the reddish colour, which was here replaced by a slight greyish tint; the size also of many of the sporules, and the filaments was much larger than those of the vegetation of the year 1843.

* Memoir on the Composition and Structure of several of the Organisms of Plants, by MM. de Mirbel and Payen.

I further observed a peculiarity which I omitted to notice in 1845, and which appears to me to be worthy of attention; it consisted in the development on the inner sides of the cavities, of an extremely thin membranous, pellicle, serving as a support to the ramifications of the filaments. In its colour and chemical characters, this membrane appeared to be connected with the development of the vegetation itself; for, like that, it became of an orange-yellow colour, under the influence of aqueous solution of iodine; it resisted the same reagents (ammonia, acetic acid, and weak mineral acids) and became disintegrated, by contact with concentrated sulphuric acid.

With a view of proving these observations, and of obtaining a precise determination of this microscopic vegetation, I had recourse to the obliging intervention of my learned friend, M. le Dr. Montagne; and we repeated together the examination of the attacked sugar. In order to describe accurately the plant in question, I cannot do better than here transcribe the determination and description given by M. Montagne, and to place before the Academy the figures drawn by himself, by the aid of the camera lucida.

The following is the letter I received from M. Montagne:—

"I have again studied the singular production which we have examined together, and on several different occasions, by the aid of the microscope, and after much indecision, owing to its ambiguous nature, have at last decided upon creating a new genus for it, to which I propose to give the name of *Glycyphila*, derived, as you see, from its *habitat* of predilection. It appears to me, that we might also include in this genus, as a distinct species, the fungus you discovered in 1843, and made known in 1847, in the *Memoir on the Structure and Composition of several Organisms*, by yourself and M. de Mirbel. In the first instance I thought of attributing these microscopic organisms to the Algæ, but I soon abandoned the idea, even with respect to those which, from their low organization, have been confounded with the mucédinæ, and the true place of which is still a matter of doubt.

These Algæ, which are called *Mycophyceæ*, in order to indicate their ambiguous nature, present, for the most part, a striking characteristic, which is here wanting, that of being developed in a liquid. It is true that, with some few, it is only necessary, in order to favour their evolution, that they should absorb the water contained in solution in the air. But these instances are rare, and their ambiguity is yet more manifest.

The following are the diagnostic characters of this new genus, which represents a parasite, which you were the first to observe.

GLYCYPHILA, Montagne.—*Fila arachnoidea, hyalina, ramosissima, membranula anhistia (ut videtur) religata, septata, hologonimica. Rami dichotomi, attenuati, sporas (?) serialas includentes. Sporæ mox liberatæ, globosæ, coloratæ, tandem conglomeratæ, juniores limbo gelatinoso cinctæ.*

These parasites, which live and propagate in crystallized sugar, sometimes form furrows, and sometimes round indentations, at the bottom of which they grow and multiply. The genus I here propose forms part of the tribe of Mucédinæ, or tribe most fertile in destructive parasites; it is placed, if I mistake not, close to the genus *Collarium* and *Sporotrichum*, with which it bears some analogy, yet without resembling them. The presence of a membrane of the utmost tenuity, which appears to result, as in the *Nostoc*, from the condensation of mucilage at the periphery, and showing beautifully the action of tincture of iodine, is of itself sufficient to determine the difference between it and the other genus. Among the Algæ it has a slight affinity with certain species of *Leptomitæ*; but again our fungi are not developed in liquids as these are, besides the formation of sporules such as I have never seen in the *Leptomitæ*. I will now give the diagnostic description of each of those two species, and a more detailed description of those we have studied together.

1. GLYCYPHILA ERYTHROSPORA, Montagne.—*Filis dichotomis, sporis rubris primitus inclusis, tandem medio conglomeratis.*

Red fungus of sugar, Mirbel and Payen, *loc. cit.*, page 6, Pl. 1 bis. (See vol. xxii. of the Mémoires de l'Académie des Sciences).

2. GLYCYPHILA ELEOSPORA, Montagne.—*Filo primario proratione crasso subnodoso, ramis dichotomis varie versis intricatisque, sporis ex umbrino olivaceis secundum ramos sparsis aut conglobatis.*

The small plant which constitutes this parasite, like many insects and even certain cryptogams, lichens, or algæ, hollows a species of cave or pit, at the bottom of which it is visible by means of a magnifying-glass on account of its olive or greyish colour,

which the whiteness of the sugar makes more apparent. When taken from its place of deposit, diluted with a drop of water, placed under the microscope, and magnified about 400 times, we readily perceive it is composed of ramose, articulated, hyalin filaments, and of coloured sporules; but all these parts are rather confused on account of their extreme tenuity; and in order to accurately observe this fungus and its organization, we ought to employ a set of lenses which would magnify to the size of 800 diameters. We then readily perceive that the principal filament has a diameter of about $0^{\text{mm}}, 0075$, that it is uneven, partitioned at distant intervals (four to seven hundredths of a millimetre), that it divides very irregularly into dichotomous branches, the diameter of which decreases until it measures only one millioneth of a millimetre. All the filaments, large and small, are colourless, and contain in their endochromes, the first, a granular amorphous substance, which is easily detected by means of iodine, the second, united globules, which might as easily be taken for conidia as for the sporules before their development, as their colouration, which is characteristic of the two species, does not appear to exist in the interior of the filaments, except in the red species. In our case it is difficult to prove if the sporules, which are evident, and scattered irregularly on the filaments, were ever enclosed in their tubes, that is to say, if they are the morphic result of the globule series.

Be that as it may, the analogy of the two plants justifies us in thinking it to be thus. Those sporules are of a dark earthy colour, with a slight olive tint. Under the microscope we may perceive a few of them enveloped, as it were, in a mucilaginous atmosphere, forming a kind of transparent coating around each of them, or sometimes around two, which have been brought together and united by this means; these are the young ones. Those which have arrived at maturity, are separate, most frequently ranged or adhering along the filaments, but yet, sometimes also, they may be found agglomerated in small balls of $0^{\text{mm}}, 01$ and more in diameter. We have also seen some, which, surrounding a bubble of air, formed a cellular tunic. As to the sporules themselves, they average in size about $0^{\text{mm}}, 003$."

In the foregoing observations, which I have the honour of communicating to the Academy, will be found, I think, a few remarkable and certain facts :—

1. A cryptogamic vegetation, propagated by its sporules, transported in the air, and unequally disseminated there.

2. These corpuscles fall in large quantities on the smooth, solid, and crystallized surface of white sugar, which is soon affected, and converted, in parts, into water and carbonic acid gas.

3. The apparently spontaneous consumption of the sugar, which nourishes an imperceptible vegetation, which, without doubt, also possesses itself of traces of nitrogenous substances interposed between the crystals; substances which, in all cases, are indispensable to the development of the plant.

We have here a fresh example of the immense power of destruction possessed by microscopic vegetation when multiplied to such an extent.

The action of these most insignificant beings, sometimes less easy of detection than in the present instance, might become, under some natural circumstances, a real misfortune to the cultivator.—*Comptes Rendus*.

ON THE RESINS OF THE "ARBOL-A-BREA AND OF ELEMI."

BY M. SAM. BAUP.

THE resin forming the principal subject of this article, and which has been known up to the present time by the name of the resin of the *Arbol-a-brea*, comes from the Philippine islands, from whence it was imported into Europe about the year 1820, by M. Perrottet, a botanical cultivator, at that time travelling for the *Jardin des Plantes* at Paris.

This resin which is sufficiently common at Manilla to be employed in calking vessels, has already been the subject of chemical research, by MM. Maujean and Bonastre. The former found it to be composed of two resins, the one soluble in cold alcohol, the other only soluble on the application of heat. M. Bonastre found it to contain as follows :—

Soluble resin	61.3
Crystallizable sub-resin	25.0
Superabundant acid.....	0.5
Volatile oil having the odour of lemon	6.3
Bitter extract	0.5
Ligneous and earthy impurities.....	6.4

100.0

Having been commissioned some time since by the Society of Natural History to examine a specimen of this resin, which had been presented by one of its members, M. Perrottet himself, I commenced a series of researches on the subject, which I was forced to relinquish for want of matter. I intended to continue the investigation when I should have received a further supply of the resin, but not being able up to the present time to succeed in this object, I thought it better to publish these researches, incomplete as they are, that they may not be lost, and also in the hope of drawing the attention of some chemist, more advantageously placed than myself, to the means of procuring from the East Indies this resin, as yet unknown in the commerce of drugs.

I have endeavoured to ascertain the botanical name of the tree yielding it, and which is known in the Philippines by the familiar name of *Arbol-a-brea* (resin or pitch tree). According to M. Maujean, M. Perrottet introduced this tree in some French colonies, and also placed some young plants in the hot-houses at the *Jardin des Plantes* at Paris, where Virey says he has seen them. It was hoped that when they flowered their botanical determination would be discovered; but on making personal inquiries on the spot even their existence was completely ignored.

Having found at the Delessert Museum, a *Flora* of the Philippine islands, published in Spanish by P. Blanco, I believe I have discovered the plant furnishing the resin in question, and which appears to me to be a species of the genus *Canarium*, L. (*Pimela*, Loureiro), of pentandria diœcia of Linnaeus; of the family of terebinthaceæ, and closely allied to the genus *Amyris*. The species to which I attribute it is the *Canarium album*, Roeush (De Candolle, *Prodr.*, vol. ii, p. 80). In the *Flora* of the Philippine islands it is described as a large diœceous tree, with pinnated leaves, four or five pairs of leaflets, alternate, oblong, pointed, entire, smooth, &c., the resin of which is used by the Indians of Manilla in the calking of their boats, for illuminating, and for divers medicinal purposes.

The resin on which I experimented, slightly resembled the resin of elemi, it was not homogeneous, but consisted of layers more or less pure, translucent, greyish or yellowish, having the appearance and fracture of silex, yielding slightly to the pressure of the fingers, and adhesive. Other portions were blackened as if smoked, which is explained by the practice followed at Manilla, of lighting a fire around the incised trees, in order to facilitate the flowing of the resin, an operation which does not appear to injure them materially. The odour of this resin resembles that of fennel, lemon, and turpentine.

Extraction of the principal Matters contained in the Resin.

1. Submitted to distillation in a glass retort with water, the resin in the first instance melts; by degrees as the essential oil distils over, it becomes of a more pasty consistence, which increases so much that it is impossible to extract the whole of the oil by this means. From forty grammes of resin, I obtained three grammes of a colourless oil, lighter than water, and having an agreeable odour. This is equivalent to $7\frac{1}{2}$ per cent., very little less than the quantity which should be contained in the resin.

2. When treated with cold rectified spirit, it leaves a voluminous residue, white or greyish, according as the portions of the resin were more or less pure.

To effect the extraction of what is called the sub-resin of the residue insoluble in cold alcohol, it is desirable to use very strong spirit, containing from 90 to 95 per cent. of alcohol, with which it should be boiled, and the solution filtered as hot as possible, in a closed funnel. After cooling, the greater portion is deposited; it is then to be put on fine cloth, strained and pressed. When all the soluble part of the residue has been thus dissolved, there remains nothing but the earthy and ligneous particles.

3. In order to obtain this sub-resin in a state of purity, it should be moistened several times with rectified spirit, placed between blotting-paper, and pressed; finally,

redissolved in boiling alcohol, from which it crystallizes on cooling in very thin white filaments, forming with the liquid a kind of magma which is thrown on a filter in a covered funnel to allow the liquid to pass away; the sub-resin, which ought to be dried in the air, is again to be washed with alcohol, and it may then be considered as very pure.

Being convinced that this is the same substance as the sub-resin of elemi, I shall employ the name of *amyrine* to designate both of them; as well that obtained from the *amyris elemifera* as the *canarium album*, or *arbol-a-brea*.

4. The alcoholic solutions containing the resin soluble in the cold, the essential oil, and several other substances, were distilled in a retort at a gentle heat, they yielded an alcoholic liquor becoming turbid by the addition of water, and contained the most volatile and fragrant portion of the essential oil. This liquor, the odour of which resembled that of orange peel and mace combined, may perhaps find favour with perfumers and dealers in liqueurs. By continuing the distillation, the liquor weaker and weaker in alcohol, becomes thick, and loses much of its fragrance.

5. After having poured the residue of the distillation into a capsule, water was added, and the evaporation continued at a gentle heat, until the expulsion of the greater portion of the alcohol; when cool the liquid floated on a semi-fluid resinous mass.

6. This soft resin, was treated two or three times with hot proof spirit, and each time on cooling the liquor was decanted and added to that of No. 5, which was reserved for the purpose of extracting other products.

7. The soft resin above mentioned, after having been treated several times by proof spirit, constitutes, if dried in this state, the soluble resin of M.M. Maujean and Bonastre. It contains among others amyrine and another crystallizable matter.

8. In order to extract this latter the above soft resin is dissolved in rectified spirit, and the solution left exposed to the air, covered with a piece of paper, so as only to allow a very slow evaporation of the alcohol, until there is a white crystalline deposit (if a portion of the deposit remains fluid and terebinthaceous, a small quantity of alcohol must be added to redissolve the fluid portion only). It is in this crystalline deposit that there is found, besides a small quantity of amyrine, that particular crystalline substance, which we wish to separate from it by successive solutions and crystallizations, until it is obtained in a pure state, crystallized in small brilliant prisms, transparent, differing much from amyrine, as we shall presently show, by referring to some of their properties. It is this substance which I announced some time since, under the name of *breine*, a name which I retain for it, although it has since been erroneously applied to the sub-resin.

Breine is only contained in very minute quantity in the resin of the *arbol-a-brea*; at least I was not able to obtain more than one per cent.; whilst amyrine constitutes one-fourth of the entire weight of the resin. I do not doubt but a larger quantity might be obtained, if the means adopted for the extraction of the different bodies composing this resin were more varied.

9. The alcoholic solution of the resin soluble in the cold, from which the breine has been removed, should be mixed in a capsule with a certain quantity of water, and heated to get rid of the alcohol with a little essential oil, then dried at a gentle heat. It then forms a transparent resin, of an amber tint, brittle, without odour, and without the least tendency to crystallize. In this state, although not pure, as it retains at least some portion of breine, it is more so than the soluble resin, of which we have spoken in No. 7; I shall here designate it by the name of *amorphous resin*.

10. The liquors and residues of Nos. 5, 6, and 9, are heated in order to get rid of the alcohol and essential oil which they still contain. During the evaporation, the liquor as it becomes concentrated assumes a vinous yellow colour, showing small drops of an oleaginous liquid, which on cooling lose their fluidity, and take the appearance of a resinous matter or of soft wax, which has been surrounded or covered with a crystallization in white filaments; these latter were collected and dried in the air, to be afterwards depurated. The evaporation with water was continued to obtain a further quantity of it. Finally, all the mother-liquors were carefully collected and preserved, in order to extract that particular substance of which I shall presently speak.

The resinous matter which became separated during the evaporation and cooling of the aqueous liquors mentioned above, was boiled in a phial with water; in the first instance it dissolved, and gave an odour of peppermint or of cardamoms, which in the end became terebinthaceous. After cooling, a small quantity of white

filamentous substance was deposited; and these decoctions were continued until the resinous matter ceased to yield any.

11. In order to purify this white filamentous matter, obtained by the cooling of the aqueous liquors of the preceding processes, it was redissolved and the solution filtered whilst almost in a boiling state, these solutions and crystallizations were repeated until the matter became of a pure white, and left no residue when exposed to heat. The property possessed by this substance, of subliming in the form of thin white needles, disposed in ramous bundles, so as to resemble a mossy vegetation, induced me to give it the name of *bryoidine* (from $\beta\rho\iota\omicron\nu$, moss, and $\epsilon\iota\delta\omicron\varsigma$, form.)

12. All the mother-liquors and aqueous residues were collected and evaporated at a gentle heat, until they became of a syrupy consistence. Two layers were formed in them; the lower one principally consisted of inorganic salts, in which chloride of potassium was the most abundant, and the upper and most considerable layer, which was of a brownish colour, had an oleaginous appearance and bituminous odour. This latter, after having been separated from the other, was diluted with water and heated, then filtered and evaporated to a syrupy consistence. After some time, brownish crystalline crusts were formed, which were washed with a little weak alcohol. The fresh mother-liquors, heated with a little water, and submitted to spontaneous evaporation, further yielded a small quantity of crystalline crusts.

These deposits when redissolved and purified by repeated crystallizations, finally produced transparent colourless crystals. I will presently describe some of the characters I have discovered in this substance, as well as the small quantity I obtained will permit me to do, and to avoid periphrase I will call it *breidine*. I did not seek to determine the nature of the acid which is met with after treating the rough resin, on account of its being found only in small quantity, and because it appeared to me probable that it might be due to the divers impurities accompanying the resin, and also perhaps to the action of air on the mother-liquors. However it may be, neither an alcoholic solution of the purest portions of the resin, nor either of the bodies extracted from it, showed any acid reaction.

According to what we have now seen, the resin of the *arbol-a-brea* contains the following substances:—

1. Essential oil.—2. Amyrine.—3. Amorphous resin.—4. *Bréine*.—5. *Bryoidine*.—6. *Bréidine*.—7. Several saline and extractive matters, with ligneous and earthy impurities.

I will now describe the principal properties which I discovered in the amyrine, and also in the three new substances contained in the resin of the *arbol-a-brea*.

Amyrine.—The sub-resin of the *arbol-a-brea* made known by MM. Maujean and Bonastre, has been described by them as a white substance, insoluble in cold alcohol, and only dissolving when heated. M. Bonastre, in particular, has described it to be of extreme whiteness, brilliant, in distinct crystals; but without any consistence, of a radiated globular form, divergent; he adds, that it retains a large quantity of interposed alcohol, which sometimes amounts to ninety-six parts to sixteen of the crystals, it then resembles a jelly; finally, when dried, it is rough and dry to the touch; he has also remarked that it was very phosphorescent, whether in a dry state or even under water.

M. Dumas, who analysed it, found it composed of

Carbon.....	85.3
Hydrogen	11.7
Oxygen....	3.0

100.0

By calculation we find

40 equivalents of carbon	240	85.41
33 " hydrogen.....	33	11.74
1 " oxygen.....	8	2.85
	281	100.00

These are exactly the same numbers obtained by M. Hess, in his analysis of the sub-resin of elemi. Thus the similitude in the composition and properties of these two sub-resins would authorize us in considering them as the same substance, for which it is desirable to retain the name of *amyrine*.

To the characters above mentioned, I will add the following: it is very soluble in

ether, from which it crystallizes in velvety fibres of great brilliancy. Absolute alcohol dissolves much of it by the application of heat, a large portion is deposited on cooling in the form of twisted filaments; a small quantity of water added to the solution renders it almost solid, by precipitating the amyrine which retains the liquid as it were imprisoned between its crystalline filaments. Water has not the slightest action on it. It is dissolved by essence of turpentine and oil of sweet almonds, more when heated than when cold.

At 174° C. it melts into a colourless liquid, which remains transparent after cooling. Cold nitric acid has no effect on it; on the application of heat, the amyrine becomes pasty, yellow, froths up considerably, giving off red vapours, and finishes by dissolving. If it then be allowed to cool, a resinous, yellow, acid matter is deposited, which has not been further examined.

Bréine.—Slowly crystallized from an alcoholic solution, it presents transparent rhomboidal prisms, of about 70° and 110°, terminated on each side by a basil, the angle of which at the summit is about 80°. By rapidly cooling it the crystals become needle-shaped.

Bréine is completely insoluble in water. It dissolves in seventy parts of rectified spirit at a temperature of 20° C.; it is more soluble in absolute alcohol; and very soluble in ether. At 187° C. it melts into a transparent and colourless liquid. Finally, it behaves as an indifferent resinous matter.

Bryoidine.—Bryoidine crystallizes in water in white silky filaments. Its flavour is slightly bitter and acid, or rather burning. When heated, its vapour gives off a peculiar odour, which produces a sudden asthma, a sensation of dryness in the throat, and induces a cough.

It melts at a temperature of 135° C. into a colourless liquid, which, on cooling, quickly becomes a mammillated fibrous mass.

Bryoidine begins to volatilize some time before it melts; when perfectly pure, it volatilizes without leaving any traces. When sublimed in thin, white, downy, branched needles, it resembles a delicate mossy vegetation, from whence its name is derived, as I have before stated. It is only necessary to place a few milligrammes in a watch-glass covered with a second one, placed in an inverse position, and to apply a slight heat to obtain almost instantaneously this sublimed product, which is one of the most beautiful substances in organic chemistry.

It is but slightly soluble in cold water; at 10° one in 350 parts only is dissolved; when heated it is much more so, for a boiling solution, saturated, becomes almost solid on cooling. As melted bryoidine dissolves very slowly, it ought to be powdered before using it for aqueous solutions. It is very soluble in alcohol and in ether; also in oil of turpentine and in fatty oils.

Aqueous solution of bryoidine is without action on litmus. Acetate of copper, chlorides of iron and of mercury, nitrate of silver, and tincture of galls do not affect it, but it is much acted upon by neutral acetate of lead, and still more by basic acetate.

Bryoidine appeared to me to crystallize without alteration in water containing carbonate of soda, ammonia, and also in very dilute acetic acid. In concentrated sulphuric acid it dissolves abundantly; and by adding water a portion is precipitated. Concentrated sulphuric acid dissolves it instantaneously, and colours it red; the solution on being heated becomes brown. A small quantity of nitric acid, added to the aqueous solution of bryoidine renders it turbid, after a few moments it becomes clear, and deposits yellowish drops. Nitric acid, poured on the bryoidine, dissolves it, giving rise to a yellow oleaginous liquid, floating on the acid, and dissolving by the application of heat.

Bréidine.—This substance crystallizes in transparent rhomboidal prisms, terminated by an elliptic pyramid, with four facets. The inclination of the faces of the prism is 102° and 78°. I have also observed crystals having the sharp angles of the prism and the pyramid, replaced by a facet. The crystals obtained by the cooling of a solution are needle-shaped prisms.

Bréidine dissolves in 260 parts of water at 10°; when heated it is much more soluble. Alcohol readily dissolves it; it is but slightly soluble in ether. Exposed to a slight heat, the crystals of bréidine become opaque. They melt at a temperature a little above that of boiling water. They sublime entirely and without decomposition; the vapour is slightly pungent, and provokes a cough. On using the same reagents to an aqueous solution of bréidine, similar results took place as with the bryoidine,

with the exception that in the former substance basic acetate of lead produced a white precipitate.

I have regretted that the small quantity of these three new substances which I have succeeded in extracting from the resin I received, has not enabled me to further examine their reactions, and above all, their analysis. I do not doubt that, notwithstanding their difference, of solubility, aspect, &c., the study of these bodies would show resemblance in composition, from amyryne the least soluble body, to bréidine the most soluble body (amyryne appears to me to be to bréine that which bryoidine is to bréidine); the manner in which they are affected by heat, indicates in several ways the degrees of relationship which it would be interesting to determine.

Elemi Resin.—Desirous of ascertaining if elemi resin did not contain analogous substances to those found in the resin of the arbol-a-brea, which it resembles in many particulars, I treated a few ounces of some fine elemi of commerce, in nearly the same way as the other; but, besides the sub-resin and the soluble amorphous resin, I only found one particular substance analogous to bréine yet very distinct from it; the small quantity I obtained did not permit me to multiply the reactions; this is the body I had announced under the name of élémine, a name which may be retained for it.

Elemine.—This substance crystallizes in hexahedral prisms, thin, transparent, colourless,* and very brilliant, terminating in points; I found amongst them a few crystals in the form of sharp rhomboids, excessively elongated. It melts at about 200°. It dissolves in twenty parts of rectified spirit at the ordinary temperature; it is more soluble with heat than with cold; and a portion crystallizes on cooling. Absolute alcohol dissolves it in the largest proportions; it is also soluble in ether. Water has no action on it, and, like bréine, it is an indifferent resinous body.—*Journal de Pharmacie.*

REPORT PRESENTED TO THE ACADEMY OF MEDICINE OF PARIS,

ON THE SUBSTITUTION OF AN ARTIFICIAL IODURETTED OIL FOR COD-LIVER OIL.

By a Commission composed of Messrs. Gibert, Ricord, Soubeiran, and Guibourt.

On the 20th of August, 1850, the Academy appointed a commission, composed as above, to whom was submitted a memoir, by M. Personne, entitled, "Researches on the Cod-liver and Skate Oils; and on the preparation of an ioduretted Oil, by which they may be replaced as Medicinal Agents." A note was also submitted to us on the same subject, from M. Deschamps, and another from M. Marchall, the latter of which claimed for the author priority in the employment of ioduretted oil of almonds, as a substitute for cod-liver oil.

We proceed now to report the results of our examinations of these communications, and of the investigations to which the enquiry has led.

Cod-liver oil has long been the object of a considerable commerce, arising principally from the decided superiority which it possesses over other animal oils, for the preparation of chamois leather; but it has only been within about twenty years that it has been used in medicine. It was first employed as a remedy for rheumatic pains, then for bronchial affections, and subsequently as a remedy for scrofula and consumption. It now constitutes one of the medicinal agents most extensively used, and one of those, on the action of which, medical men place the greatest reliance, as a remedy capable either of curing very formidable diseases, or of retarding their fatal termination.

The most important memoir which has been published on cod-liver oil is that of Dr. Jongh, in which three kinds of oil are described as met with in commerce, which are called the *black*, the *brown*, and the *white*, cod-liver oil. These oils are represented to consist, principally, of oleic and margaric acids, and glycerine, and, as

* These colourless crystals, some time after their formation became yellowish at the end of several years, although enclosed in a tube. An analogous coloration, but quicker and more decided, took place with very pure and originally quite colourless *abietique* acid, which had been obtained from the resin of the *Pinus abies* (*Abies excelsa*, De Cand.) and also with colourless *pinique* acid, obtained from a French colophane, supposed to be derived from *Pinus maritima* (*Annales de Chimie et de Physique. loc. cit.*, where an error in the typography makes me appear to state that these resinous acids combine with *acids*, which should be read *oxides*).

accessory bodies, of butyric acid, acetic acid, some principles appertaining to the bile, a non-azotised yellow or brown colouring matter, called gaduine, iodine, phosphorus, and some inorganic salts. In France, Messrs. Girardin and Preisser, have been engaged in comparing the effects of the oil obtained from the cod with that obtained from the ray; and they advocate the superiority of the latter for medicinal use. But this superiority seems to depend, in part, on the circumstance, that the oil obtained from the livers of the ray, being carefully prepared by the pharmaciens, and being transparent, and of a light yellow colour, proves less offensive to the patients than the cod-liver oil of commerce, which is generally thick, of a dark colour, and has a disagreeable flavour. This, however, is scarcely admitted at the present time. Moreover, it appears from recent observations, that the above characters cannot be much depended upon for distinguishing the two kinds of oil, in consequence of their being so variable.

According to Messrs. Girardin and Preisser, these two oils contain iodine in the state of iodide of potassium, and in quantity much less than had been indicated by Dr. Jongh. The latter author gives, as follows, the quantity of iodine in 1000 parts of oil:—

Black cod-liver oil.....	0.295 parts of iodine
Brown ditto	0.406
White ditto	0.374

Messrs. Girardin and Preisser have found in a litre (thirty-five fluid ounces),

Of ray-liver oil.....	0.180 gramme of iodine
Of cod-liver oil.....	0.150

According to M. Gobley, a litre of ray-liver oil, prepared by direct action of the fire, contains twenty-five centigrammes of iodide of potassium. M. Gobley was unable to find phosphorus in this oil.

Such were the principal analytical results known when M. Personne presented his memoir to the Academy. The uncertainty which appeared to attach to the subject, and the variations in the statements of Chemists, induced him to put to himself the following questions:—

1st. Do the oils of cod and ray-liver contain iodide of potassium or iodine?

2nd. Do the different sorts of these oils contain the same proportion of iodine?

3rd. Do these oils contain phosphorus, to which their effects may be partly attributed?

For detecting the presence of the iodine, M. Personne saponified the oil with an excess of caustic potassa, incinerated the soap, and treated the product of incineration with strong alcohol. The alcohol was evaporated, the residue dissolved in water, and to this, solution of starch and sulphuric acid were added. The quantity of iodine was estimated by the intensity of the colour; it is too small to be estimated by the balance.

M. Personne examined in this way the dark brown and thick cod-liver oil, such as is employed in the hospitals of Paris; the transparent and nearly colourless oil of English commerce; and the ray-liver oil prepared by the direct action of a moderate heat, and subsequent filtration. The following are the results:—

1st. The brown cod-liver oil of the hospitals of Paris contains more iodine than the fine white oil of English commerce.

2nd. It also contains more iodine than the ray-liver oil, and, moreover, the quantity present is certainly less than a decigramme of iodine in a kilogramme of oil (1 in 10,000.)

3rd. The residue of the liver, left after the preparation of the oil, contains much more iodine than the oil itself.

With regard to the question as to whether the iodine exists in cod-liver oil in the state of iodide of potassium, or directly combined with the oil, M. Personne, while he admits the difficulty of satisfactorily determining the point, inclines to favour the opinion that the iodine is directly combined with the elements of the oil.

[The different methods which have been suggested for the preparation of the ioduretted oil proposed as a substitute for cod-liver oil are described, but these are omitted here, as the process is given at page 231 of this Journal, in the number for November last. A discussion follows of the claims of the authors, whose communications were submitted to the commissioners, for having first introduced the artificial ioduretted oil, which discussion is also omitted here as being uninteresting to our readers. The commissioners next proceed to state the result of the evidence

obtained, by the medical members of the commission, of the therapeutical action of the artificial ioduretted oil.]

M. Gibert administered the ioduretted oil for periods varying from several weeks to several months, to patients suffering with eruptive complaints and scrofulous tumours; and, in some instances, found the benefit to be greater than from the use of cod-liver oil, under similar circumstances. He states, that he does not think he has tried it in a sufficient number of cases, and for a sufficient length of time, to enable him to state decidedly what its absolute value is as a specific for eruptive and scrofulous complaints; but the results he has obtained are sufficient to prove, that it is easy of administration and devoid of any injurious quality, and that it possesses a resolute action, which renders it a valuable remedy for certain chronic eruptions and glandular swellings.

M. Ricord has employed the ioduretted oil for twelve months, in a great number of cases of scrofula, some of which were considered to be of venereal origin. He thus obtained excellent results in the treatment of strumous bubo, tubercular epididymis, and in some cases of scrofulous enlargement of the joints, &c., and, other things being equal, curable cases were cured, or relief afforded, much more quickly by the use of the artificial ioduretted oil than by the natural cod-liver oil.

The average dose in which the ioduretted oil was administered was sixty grammes (ʒij.), which was sometimes raised to 100 grammes (ʒiiss.) The patients generally took it without inconvenience. It was only in a few instances, where the dose had been raised, that vomiting, colic, and diarrhoea were produced. If the precautions which are necessary in the administration of every remedy be observed, and the degrees of susceptibility of the patients, together with all special conditions, properly studied, it may be affirmed that the ioduretted oil is a medicine of great value, and that it presents considerable advantage over the cod-liver oil.—*Journal de Pharmacie.*

[The dispute between claimants for priority of discovery shows the importance which the profession in Paris has attached to this imitation of cod-liver oil. If the efficacy of cod-liver oil depend upon the iodine, it is a great advantage to be able to regulate the proportions of this ingredient according to circumstances, and it is not improbable that the artificial may be equal, if not superior, to the genuine oil in those cases in which iodine is especially required.]

We have always been of the opinion that the effect of cod-liver oil is as much dietetic as medicinal. When the stomach recoils against it, instead of producing any benefit, it takes away the appetite, causes nausea, and appears to disorder the digestive organs. But when the repugnance is overcome, or when the patient has naturally a liking for it, the effect is exactly the reverse. The appetite increases, and with it the weight and substance of the patient. It may therefore be inferred that the digestive functions are materially concerned in the production of those changes in the animal economy which are found to result from the administration of cod-liver oil.

The following incident, which lately occurred, serves to show the facility with which the oil is absorbed and distributed in the system.

A considerable quantity of refuse livers, which had been subjected to the usual process for extracting the oil were sent into the country, and buried under some rubbish to form manure. Several pigs, which were at large on the premises, discovered the treasure and fed upon it. The fact was not known at the time, nor is it known for how long a period they were in the enjoyment of the luxury. As they were observed to be in very good condition, one of them was killed, without the usual ceremony of shutting up to fatten. The fat was unusually yellow, and the flesh had a peculiar appearance. During the process of cooking a strong smell filled the kitchen, exactly like that arising from the boiling of a large quantity of

cod-livers. The pork itself, especially that which was pickled, was so strong, that it was not fit to be eaten. It appeared to be saturated with oil, which exuded from the lean as well as the fat when cut or pressed, and did not solidify on cooling. The smell was exactly like that of cod-liver oil slightly rancid. The lungs and liver were equally saturated, and the hams appeared as if they had been soaked in oil, which interfered with the action of the brine.

There is nothing extraordinary in the fact that the flesh of an animal is influenced by the food, this being the cause of the delicacy of dairy-fed pork ; but the complete saturation of an animal with oil, the sensible properties of which appeared to be so little altered, is a circumstance which we never before observed, nor have we ever heard of this effect being produced by fattening animals on linseed-cake, or any substance containing a vegetable oil.—Ed.]

ON THE PROPORTIONS OF IODINE CONTAINED IN COD-LIVER OILS.

BY MM. CHEVALLIER AND GOBLEY.

We have followed the process indicated by MM. Girardin and Preisser. It consists, as is known, in saponifying the oil by an excess of a solution of caustic soda, at 25 degrees, then heating it, without allowing it to boil, until a perfect combination takes place, and afterwards evaporating the whole to dryness. The soap obtained is to be carefully carbonized in a closed crucible ; towards the end of the carbonization a sufficient quantity of carbonate of ammonia is to be added to convert the excess of caustic soda contained in the mixture into carbonate. The carbonaceous residue is then exhausted by boiling alcohol at 96.100, and the alcoholic liquors evaporated to dryness, leaving a slightly saline residue consisting of iodide of potassium.

As we wished to arrive at more certain results than MM. Girardin and Preisser, we estimated, by means of chloride of palladium, the quantity of iodine contained in the saline residues ; and in this manner we have been able to determine the actual quantity of iodide of potassium contained in the cod-liver oils we wished to examine.

The following are the results we obtained :—

1	litre of cod-liver oil yielded	0.10	gramme of iodide of potassium.
2		0.08	" " "
3		0.04	" " "
4		0.03	" " "

—*Journal de Chimie Medicale.*

ON CINCHONA RUBRA AND C. SAVANILLA.

BY J. B. BATEA.

In the year 1824, I expressed, in Stoltze's *Jahrbuch*, my doubts about the assertion of himself and Hayne, that, according to Humboldt's collection, *cinchona rubra* was identical with *cinchona nova*. But, after having seen Mutis's original bark, in the collection of the *Jardin des plantes*, at Paris, I discovered my error, and apologize for the injustice I did to my regretted friends, by supposing that they spoke of the real *cinchona rubra* of commerce,* which is certainly quite different. The barks of that collection, and of the samples which were sent to Paris, by Mutis, in 1790, are really identical with that *cinchona nova*, which, till 1805, had maintained its genuineness in the North-American trade, as *red bark*, and since 1820, in the collections of Denmark, as *cinchona rubra*. I am now enabled to give this explanation, so important for pharmacognosy, by having come into possession of a valuable Spanish pamphlet, "*Varias noticias sobre las Quinas officinales de St. Fé en Cartagena de Indias*, by Dr. Jose Ignacio Pombo, 1805," which can only be regarded as a defence of Mutis's system,

* Described in my treatise on cinchona barks in Trommsdorff's *Journal*, Bd. vii.

but the partiality of which must also strike the reader, as it will enable him to judge of the actual ignorance of a man, so highly esteemed by me as Dr. Mutis, exposed by his own entirely spurious barks. His *quina roxa*, and even his *quina blanca*, are not the produce of a *cinchona*†. Of his synonyms only *cinchona grandiflora*, and *cinchona lopeziana*, R., agree with his *quina roxa*, synonymous with *buena obtusifolia*, R. and P.; and, consequently, are no *cinchonas*; *cinchona magnifolia*, R. and P., *cinchona lutescens*, P., certainly yield other barks than those 15 and 80 chests of *cinchona rubra*, which were first exported by Dr. Seb. Lopez, were shipped in 1790 and 1804, from St. Martha and Maracaibo, and arrived at Cadiz, in the frigate *Parairo*, to the order of the Royal Commissioner, Dr. Michele Arrayo; but which were confiscated as spurious, and, in the year 1804, were declared, by the medical faculty of Madrid, to be inefficacious (*inútiles por los ningunos efectos*). Mutis, Caldas, and Zea, declared this to be an intrigue of Ruiz and Pavon, who, speaking of their *cinchona dichotoma*, in their *Quinologia*, say, that the worst sorts of bark from Peru, are better than the best from Santa Fé.

Mutis was supported by the authority of Humboldt, or else the matter might have been decided in 1804, by a strict scientific investigation; but, as the *cinchona rubra* is not official in Spain, no attention has been paid except to the so-called *quina calisaya del rey* (*China regia*, from Santa Fé) the origin of which was considered doubtful in the *Pharmacopœa Hispana* of 1817.§ As regards the chemical examination of this *quina roxa* of Mutis, from the collection of the *Jardin des Plantes*, the result will be seen in the subjoined table, together with that of *cinchona nova*, from Pelletier's collection, and that of *cinchona Savanilla*, imported this year (1850) from St. Martha. The latter was sent to us from the province of Santa Fé, by the same place from whence all barks of that country were generally exported in 1778 and 1804, to Cadiz. It arrived in Hambro† in September, 1850, in sacks of 70 lbs., and was immediately recognised as a quality resembling *cinchona nova*. Its appearance is very fresh, and the pieces, more flat than semicylindrical, are from 1 to 1½ in length.

a. The external epidermis, which, in *cinchona nova*, is generally whitish, and firmly adherent, appears here to have been scraped off, as in *cinchona roxa* of Mutis, and only here and there a few darker and lighter-coloured round streaks of the former epidermis are transparent. It has, like *cinchona nova*, irregular transverse cracks, on the brown epidermic-sublayer, and the characteristic, dark-reddish, resinous border on the edges.

b. The fracture is fine splintery.

c. The internal surface of the flat pieces is of a dark cinnamon colour, that of the quilled pieces is often coloured yellow by the cambium of the plant, peculiar also to *cinchona nova*, and *roxa* Mutis. The structure in the semiquilled pieces is firm, with long fibres; but, in the flat pieces, the longitudinal bundles of vessels are shorter, and arranged in layers, one over another; and the inferior layer, when opened, is of a lighter colour.

d. The coarse powder is of a cinnamon colour.

e. The taste is somewhat different from that of *cinchona nova*; it is more like cinchona-bitter, afterwards tannic (astringent), whilst that of *cinchona nova* and *roxa* of the collections named above, is acidulous, bitter, less smoky, and somewhat aromatic.

f. The infusion is of a pale and pure hyacinth-colour.

g. The decoction is pale and very milky, as is the case with that of the genuine barks, for which reason it was probably considered by the exporters as genuine, and sent to Europe. It cannot be denied, that the decoctions and infusions of *cinchona nova* and *roxa* Mutis, the first being of a dark colour and turbid, the latter more ruby-red, differ from those of *cinchona Savanilla*; but, considering that the *cinchona nova* is at least fifty years old, and the *cinchona roxa* Mutis more than sixty years (the latter having been for more than thirty years locked up in a box,

† According to a royal edict, dated Madrid, May 11th, 1789, the *quina roxa* and *blanca* were prohibited from being imported into Spain as *Quina del rey*, like the *naranjada* and *amarilla*.

‡ Page 48 : La corteza del arbol que haman Dichotoma, que reconozco de especie dudosa es superior à la major de las quinas de Santa Fé, las quales aseguran son inferiores à la peor de las del Peru.

§ According to the specimen contributed by Mutis personally (*Jardin des Plantes*), this is his *Quina naranjada*, *Cinchona lancifolia*, R. and P., and is identical with the commercial *China flava* *Carthagenæ* described by myself in Tremmsdorff's *Journal* and Bergen's *Monographia*.

the key of which had been lost) it will be admitted that the tannin of the bark must have become more highly oxidized, the starch and gum converted into insoluble bassorin, whilst in the spurious bark of *Savanilla* they are still unchanged (easily soluble). This accounts for the circumstance that the infusion and the decoction of the older barks are darker, and the reaction of the tannin on the emulsin substances (fat and gum) weakened, which manifests itself more distinctly in the fresh bark, where the vegetable albumen, dried up in the old bark, co-operates in producing turbidness.]

In order fully to establish the identity of *cinchona roxa* Mutis with the barks of *cinchona Savanilla* and *cinchona nova*, I have, according to Wöhler's method, extracted from it kinovic acid by means of milk of lime. I washed the flaky precipitate produced by muriatic acid, on a filter, dissolved one portion of it in ammonia, and precipitated it by carbonic acid; the other portion I dried, triturated and precipitated it with water from an alcoholic solution in the form of a hydrate. As I had only half an ounce of *cinchona roxa* at my disposal, I was obliged to content myself with these qualitative experiments; which, however, sufficiently justify me in supporting the opinion that the original *cinchona rubra*, which, according to all existing reports was first brought to Europe in 1778 by Dr. Sebastian Lopez, from Santa Fé, was not genuine cinchona bark, that it is identical with *cinchona nova* (according to my experiments with *cinchona Savanilla*), and that all three probably belong to the genus *Buena*, fam. *Rubiaceae*, as well also as the *cinchona nova Braziliensis*, which I place in the category of these barks on account of its physiological and chemical characters.

Reactions of Cinchona rubra of Mutis, Cinchona nova, and Cinchona Savanilla.

Sort of Bark.	In Reflected Light.		Galls.	Galatine.	Emetic Tartar.	Sugar of Lead.	Sulphate of Iron.
	Decoction.	Infusion.					
<i>Cinchona roxa</i> Mutis, 1790 (Jardin des Plantes)	Dark brown turbid	Red brown	0	Dirty flesh-coloured precipitate	0	Brownish violet	Inky turbidness
<i>Cinchona nova</i> , 1801. (From Pelletier's Collection)	Dark brown red not transparent	Dark brown-red, clear	0	Ditto	0	Dirty greyish brown	Ditto
<i>Cinchona Savanilla</i> , 1850 (From Hambro)	Cinnamon coloured milky	Hyacinth red, pale	0	Pale flesh-coloured precipitate	0	Flesh-coloured violet	Ditto

NEW LEBANON :

ITS PHYSIC-GARDENS AND THEIR PRODUCTS.

THE beautiful valley of New Lebanon, situated about thirty miles east of the Hudson river, in the State of New York, and noted for its attractive watering place, the resort of many pleasure-seeking travellers in the summer months, has long been celebrated for its gardens devoted to the culture of medicinal plants, with a view to the supply of apothecaries, druggists, and others in all parts of the United States. For a long time this business was solely in the hands of the people called "Shakers," who originated it as a regular pursuit, and who yet are largely concerned. During the past summer, whilst on a visit to the valley of the Hudson, we accepted an invitation from Mr. Henry A. Tilden, to visit his gardens and laboratory, situated in

|| The presence of vegetable albumen in barks has never yet been spoken of, though I have always found it in my analysis of barks. The process is very simple; the infusion of the bark requires only to be boiled, when the albumen coagulates. In the decoction, which dissolves also the starch and the gum and a larger proportion of tannin (cinchona-tannic acid), these substances form, as milk in coffee, emulsions which we daily consume. Protochloride of mercury also precipitates the albumen; and if the coagulated precipitate, or even the dried extract of the infusion and of the decoction be tested with soda-lime we obtain distinct evidence of the presence of ammonia.

the township and village of New Lebanon, where he and his brother conduct an extensive business in the culture, drying, and packing of plants, and the preparation of medicinal extracts. The Messrs. Tilden informed us that they have about forty acres cultivated under their immediate superintendence, somewhat in the following arrangement;—Nine acres in taraxacum, two in conium, three in hyoscyamus, three in belladonna, three in lettuce, three in sage, two summer savory, two stramonium, two burdock and dock, one marjoram, two digitalis, two parsley, poppies, and horehound, one aconite and balm. The remainder are occupied with basil, button snake root, blessed thistle, borage, coriander, feverfew, hollyhock, hyssop, larkspur, lovage, marshmallow, marygold, mugwort, mountain mint, southern wood, tansey, &c. The narcotics, especially the hyoscyamus and belladonna, require a rich soil, and they exhaust the land rapidly. These last attain a height in many instances of five feet, but in general from three to four. They are liable to be preyed upon more or less at all seasons of their growth by insects and worms peculiar to each, to such an extent in some instances, as to destroy the crop. Conium maculatum grows spontaneously in all that region of country, having become naturalized. It is seen along the roads, and in fields that have been abandoned for a time, attaining often the height of six feet, and presenting a striking object to the eye, by reason of its subdivided foliage. For this reason, the Messrs. Tilden do not cultivate this plant very extensively, but depend largely on that of spontaneous growth, which they gather from the country many miles around, as far as the Vermont line, and in Massachusetts. It is probable that the conium obtained in this way is really more active, weight for weight, than the cultivated, being less succulent. We noticed the Valeriana officinalis growing with great luxuriance, and as high as five feet, although its culture has not as yet been much extended. Besides the varieties cultivated, large quantities of indigenous plants are purchased from collectors in the west and south, which are required in their business.

Their factory or laboratory is an extensive, oblong, three storied building, in the basement of which is a powerful steam engine which performs the double duty of propelling the powdering apparatus, and of driving a double acting air pump connected with their vacuum evaporators.

The recent plants intended for extracts are brought to the mill from the gardens, reduced to a coarse pulpy state by a pair of chasers, and subjected to a powerful screw-press to extract the juice. This is clarified by coagulation, strained, and the pure juice introduced into the large vacuum apparatus, holding several hundred gallons, where it is concentrated rapidly to a syrupy consistence, at a temperature varying 110°—130°, almost entirely free from the deteriorating influence of the atmosphere. In the construction of this apparatus, they have had a view to great extent of tubular steam-heating surface, so as to be able to accomplish the very large amount of evaporation their business demands. The finishing apparatus is analogous to the vacuum pan of the sugar refiners. We witnessed the operation in progress with the thermometer standing at 112° F. They make annually about 8000 pounds of extracts from green plants and roots, consisting chiefly of conium 2000 lbs., dandelion 2000 lbs., lettuce 1200 lbs., stramonium 500 lbs., butternut 800 lbs., belladonna 500 lbs., hyoscyamus 500 lbs., and so on. These extracts in the aggregate, according to Mr. Tilden's estimate, are derived from about 300,000 lbs. of green material, and require the evaporation of more than 20,000 gallons of juice.

Besides these, a considerable amount of extracts are made from dry materials, both foreign and indigenous, as gentian, rhubarb, chamomile, mayapple, horehound, cohosh, &c. They are also about engaging largely in the manufacture of extract of liquorice from foreign root.

In the powdering department they run burr stones and chasers, and use bolting and dusting apparatus. They powder large quantities of material on contract, besides that for their special business, amounting annually to from 50 to 60,000 pounds.

In the herb department, the quantity of material handled is very large. The plants are brought from the gardens into a large room in the factory building, where a number of girls are employed in picking them over to remove other plants accidentally present, and separating the decayed parts and the stems when desirable. They are then placed on hurdles, and exposed in the drying room till properly desiccated. Two presses are kept in operation, by which 2000 pounds of material are sometimes pressed in a week, and about 75,000 pounds per annum, including near three hundred varieties of plants.

At the time of our visit, thirty men and five girls were engaged in the several departments of their establishment.

When we consider the large amount of extracts of important drugs prepared in vacuo, which are thus thrown into the market to replace the former crude products, obtained by boiling down the juices, &c. in open vessels with a naked fire, according to the old method, we cannot but believe that much good will accrue to the medical practitioner in the increased power of these agents. The Messrs. Tilden have, thus far, been *directly* beneficial to the medical interests of the country. But they have also been indirectly useful by inducing their neighbours, the Shakers, from motives of competition, to adopt the vacuum pan, in lieu of the open boiler, in the preparation of their extracts. We have some few observations to make in reference to the medicine-producing department of this remarkable people, who received us kindly during a hurried visit whilst sojourning in their beautiful valley, but we are compelled to defer them till our next issue.—*American Journal of Pharmacy*.

NOTE ON THE OIL OF GERANIUM HAVING THE ODOUR OF ROSES.

(*Pelargonium odoratissimum*).

THE geranium which has the odour of roses will yield on distillation an *aromatic water* and an *essential oil*. M. Recluz, a Chemist at Vaugirard, has stated, that previous to the year 1819, he had, by order of M. Tissier, Chemist and professor of Chemistry at Lyons, submitted to distillation 1590 grammes of the leaves of this plant, operating by cohobation twice, he obtained eight grammes of a concrete volatile oil, analogous, in its odour, to that of the rose, congealable at 18° C.

Since the publication of M. Recluz, this question has made rapid progress, for there is now prepared in France a large quantity of the essential oil of geranium, which is used in perfumery.

The geranium, to obtain the essence, is cultivated in the south. It has also been cultivated in the department of Seine-et-Oise, at Moutfort-Lamaury, and, according to M. Demarson, who has occupied himself and given much attention to this subject, its cultivation is easy; under our temperature the geranium thrives, especially when the nights are fresh.

The oil obtained in the department of Seine-et-Oise, is more agreeable in its odour than that obtained from the geranium cultivated in the south; the same is remarked with the geranium as with the orange-flower.

The geranium is propagated by slips. These slips are planted usually in February, but they may be planted at any season.

100 lbs. of geranium leaves yielded from 54 to 55 grammes of essential oil; these leaves are sold at from 30 to 35 francs the 100 lbs., but care must be taken in the weighing, as they are not always well picked, and contain foreign matter, which increases the weight but does not yield oil. The distilled water which has been used in the production of the oil has some analogy to rose-water, but it has a *vegetable odour*—an odour *sui generis*—which distinguishes it from it. This water, which was at first sold at 1 franc 25 cents the litre, has fallen to 60 centimes the litre.

The oil of geranium was, in the first instance, sold at a very high price; it has since fallen to 30 francs, to 25 and 20 francs, at last to 15 and to 12 francs.*

The oil of geranium of the Paris houses is of a green colour; that of Nice is colourless. This oil is employed in the manufacture of essence of roses, which is very expensive. After having been used for adulterating, it is in its turn adulterated.—*Journal de Chimie Medicale*.

ON VEGETABLE MUCILAGE, AND SUBSTANCES ALLIED THERETO.

BY DR. KÜTZING.

HAVING sliced off with the razor a very thin piece of the white, broad sort of tragacanth, and placed it in a drop of water under the microscope, it swelled up instantaneously, and showed a distinctly cellular structure, and much larger starch-grains than usual. The cells consisted of a very thick membrane, and partly of several concentric layers. The starch grains were round and crowded in the cells, which were but loosely connected, and of various sizes, some of $\frac{1}{10}$ " diameter.

* It is not stated for what quantity this price is charged.—*Ed. Pharm. Journal*.

No reaction was produced on the thick cell walls by tincture of iodine, but the starch grains became blue. On adding one drop of concentrated sulphuric acid, the cells swelled up still more, and the concentric layers became more distinctly visible, and, at the same time, assumed a yellow or brownish-orange colour. The inner cell-wall now appeared to be coated with a delicate blue membrane, which enclosed the starch-grains in the form of a sac. The starch-grains, by continued application of sulphuric acid, were converted into dextrine, and at last disappeared, as well as the blue membrane, but the thick cells still remained, though they lost the property of becoming orange or yellow by iodine; they remained at last entirely colourless by tincture of iodine, but upon the application of heat also dissolved.

These results induced the author to examine various other gums, and to watch the process of their formation in the plum-tree gum, which exudes from the trees belonging to *Drupacea*, and, by the aid of iodine and sulphuric acid, he discovered that the cellulose of phanerogamic cells are coloured blue, while that of all lichens and fungi which he examined, are coloured orange or yellowish-brown by the application of sulphuric acid and iodine. All the kinds of natural gums of commerce present the same appearances, but with this difference, that those which contain more bassorine than arabine, present the iodine reaction with the aid of sulphuric acid for a longer time, whereas in gum arabic it disappears sooner. To the phanerogamia, which present a blue colouration, belong cotton, the cells of endive leaves, of cucumbers, and of the wood of cruciferae.

It is, therefore, manifest, that the denomination of cellulose has hitherto been applied, upon the authority of Payen,* to two classes of substances, one of which is coloured blue by iodine, the other brown. The blue colour indicates the presence of starch, or rather of the substance out of which starch is formed, and the brownish-yellow colour reminds us of inulin. We may, therefore, divide the mucilaginous and cellular substances into two groups, the one the amylon or starch-group, the other the inulin-group. That inulin is more allied to tragacanthin or bassorin and arabin than to starch, is shown by the fact, that like arabin, it rotates to the left, the plane of polarized light. In common with all the substances allied to starch, cellulose, and gum, it is changed into dextrin and sugar by the action of acids.

Group the first includes, 1, starch; 2, starch-cellulose.

Group the second includes, 1, inulin; 2, inulin-cellulose or bassorin.

The author applies the name of *amyl* to the starchy, or amylaceous matter, in order to distinguish it from amylum or starch. Its formula is $C_{12}H_{10}O_{10}$, and its reaction with tincture of iodine characterises it. As, according to Mitscherlich†, starch cellulose consists of $C_{12}H_{10}O_{10}$, the whole difference between *amyl* and starch-cellulose, denominated by the author, *gelin*, is, that the *amyl* substances are instantaneously coloured blue by tincture of iodine, and the *gelin*-substances only upon the additional influence of sulphuric acid (or of alkalies).

So also with regard to the second group: the inulin-globules are at once coloured orange or brownish-yellow by iodine, whereas the bassorin substances became coloured only upon the additional application of sulphuric acid. The lichen-cells in the cortical layer and in the fruit-parts of *Cetraria islandica* consist of true *amyl*.

In investigating the formation of gum, the author perceived on breaking off the exudation from a plum, that not only the epidermis, but also the cells of the juicy parenchyma were at this spot in part already decomposed, and in part undergoing decomposition; the result of which is, that unlike those kinds of putrefactions, which are connected with the formation of certain fungi (*Fadenpilze*, *Staubpilze*, &c.) the organic product is a peculiar, hitherto unknown fungus, the *gum-fungus*, or the gum itself. The brown colour of these parts proceeds from the cell walls, which are partly decomposed and converted into ulmin. The organic structure of the cherry- and plum-tree gum, which the author proposes to call *crasinium*, is very distinct; as long as the gum is still in the fruit, or just about issuing from it, but forms a homogeneous mass as soon as it has exuded. On examining the cellular tissue of plums with iodine and sulphuric acid, it will be found, that the healthy part consists of *gelin*-cells, whilst the membranes of the affected portion have been converted into a bassorin-substance, which has partially become brown from the presence of ulmin. The walls of the latter portion are, moreover, very thick and loose, so that in those which are near dissolution, a peculiar system of very fine reticulated mucilage fibres can be seen upon close examination. These fibres disengage themselves gradually, but still running parallel to one another, and causing by swelling a pressure without;

* *Annales des Sciences Natur.*, Ser. 2, tom. ii.; *Botanique*, 1839, p. 21; 1840, p. 73.

† *Bericht d. Berliner Akademie d. Wissenschaften*, März, 1850.

at last they are decomposed into very small molecules, which retain the original position of the fibres. These molecules are the beginning of a new cellular formation; they become larger and now contain one or two new cells, which again contain filial cells [*Tochterzellen*] and so on, until the cells become liquified and the mass exudes. The substance called by Guerin Varry *cerasin*, consists sometimes of such semi-liquified cells. The opinion of Mulder (*Physiol. Chemie*, p. 234), that all kinds of gum are vegetable secretions and formed of dextrin, is, therefore, refuted, as well as the opinions of Nägeli and others, that a protein substance or nitrogenous "Protoplasma" must form the nucleus for cell formation, and that fungi are characterized by the want of starch.—*Archiv d. Pharmacie*, 2 Reihe, Bd. lxvii., Hft. 1, 1851, p. 1.

ON THE INFLUENCE OF WATER IN CHEMICAL DECOMPOSITIONS.

BY H. ROSE.

In chemical processes water acts principally by its chemical mass; it sometimes plays the part of an acid, at others of a base, and can expel acids and oxides from their combinations. Even compounds in which a great attraction exists between the constituents, such as many native silicates, *e. g.*, felspar, can, although only after a long time, be decomposed by water. It is difficult, and in most cases impossible, to imitate in the laboratory these processes, which are carried on by nature on a large scale, because we cannot so accelerate them that we can await the result.

If a very strong acid be united with a strong base to form a neutral salt, as is the case with the neutral sulphate of potash or soda, and the compound be dissolved in water, it certainly remains undecomposed in the solution, however large the quantity of water may be. Although the water shows a considerable attraction, both for the sulphuric acid and for the alkali, yet the attraction which the water, as a base, has for the sulphuric acid, and that which it has, as an acid, for the alkali, in this case so counterbalance each other, that the decomposing effect of the water is quite neutralized. But it is possible, that when the chemical mass of the water is very considerably augmented, a very dilute solution of the alkaline sulphate might behave very differently to a concentrated one. For if the attraction of the water for the sulphuric acid and that for the alkali were imperfectly, but not entirely, to counterbalance each other, this would be less evident in a concentrated than in a diluted solution, in which the large quantity of water might take one of the constituents of the salt in preference to the other. This relation of water can, therefore, be more conveniently watched, if we examine the relations of the acid compounds, both of the potash-sulphates and of the soda-sulphates, towards water. In these one portion of the sulphuric acid is combined with the alkali by a less degree of attraction than the other. The water can, therefore, if employed in a sufficient quantity, abstract more or less acid from the salt, and finally convert it into the neutral compound.

The bisulphate of potash employed for the experiment was KO SO_3 , HO SO_3 . It contained a small additional quantity of water, because the fused cake of the salt had been exposed to the air.

This salt having been mixed and boiled with so large a quantity of water, that part of it still remained undissolved, the filtered solution solidified when cold, into a white, apparently uncrystallized mass, which internally resembled cooled tallow; but it contained a large quantity of inclosed acid mother-liquor, which was entirely removed by repeatedly pressing the salt between blotting-paper. It then had the form of a coarsely crystalline powder, the composition of which was KO SO_3 , HO SO_3 , 2HO . The potash, consequently had, by this process, lost none of its sulphuric acid, but had gained more water.

The salt was then completely dissolved in boiling water, and the solution evaporated, until when cold—a small quantity of crystalline crust separated. The salt thus obtained, consisted of 3KO SO_3 , SO_3 , 2HO . The mother-liquor, removed from this salt, yielded by evaporation, a large quantity of salt of the same composition; so that the latter appears, therefore, to possess a certain constancy. If, however, this salt, after being removed from the mother-liquor, was redissolved in water, and the solution evaporated to crystallization, crystals of the neutral sulphate of potash were formed in it.

This proved that, by the influence of water, sulphuric acid can be gradually abstracted from the bisulphate of potash, and the latter finally converted into a neutral salt. The same effect may be produced at once, if the chemical mass of the water be increased, and the bisulphate treated, directly, with a very large quantity of

water. We may, therefore, assume, that in a very diluted solution of the acid salt, there exists the neutral salt, besides the free sulphuric acid, which combination, concentrated by evaporation, again forms the acid salt. It is, therefore, better, gradually to remove, in the described manner, the excess of sulphuric acid, when the acid salt is intended to be converted into the neutral one.

By decomposing the bisulphate with water, several other salts, ranging between the acid salt and the neutral salt, are generated by the influence of different quantities of water employed. One of them, obtained by Mitscherlich, had the composition, $4 \text{ KO SO}_3 + \text{HO SO}_3$, and another by Phillips, Jacquelin, and Heumann had the composition $2 \text{ KO SO}_3 + \text{HO SO}_3$. The latter salt is the sesqui-sulphate of potash.

In the bisulphate of soda the second atom of sulphuric acid is united by a less degree of affinity than in the bisulphate of potash. It can, therefore, be more easily abstracted by water; and there appears to exist only one intermediate compound between this and the neutral salt. The bisulphate of soda in the crystallised state is composed of Na O SO_3 , HO SO_3 , + 2 HO . The intermediate compound forming crystals, often more than an inch in length, consists of $3 \text{ Na O SO}_3 + \text{HO SO}_3 + 2 \text{ HO}$. Water has also a similar relation to these salts, which appear to be composed of two or more simple salts, such as the so-called double salts. Many of these can be separated from one another by solution in water and recrystallization. In those which consist of a salt not easily or at all soluble, and of another easily soluble, the former remains undissolved when treated by water, as is the case with glauberite. In other double salts of this kind, such as Gay-lussite and the carbonates of soda and oxide of zinc, the two salts are united by a greater affinity. In the case of Gay-lussite, if the salt be ignited the proportion of the water of crystallization is expelled, the affinity of the carbonate of lime for the carbonate of soda is so far diminished that water dissolves the latter salt, leaving behind the former one undissolved. One of the most remarkable double salts in this respect, is polyhalit, which consists of three simple salts. When this is treated with a small quantity of water the sulphate of lime remains undissolved, whilst the sulphate of magnesia and sulphate of potash are dissolved. Of the double salts, which can be easily procured in large quantities, alum resists most the decomposing effect of water. It can be repeatedly dissolved and recrystallized, without suffering the slightest decomposition, although the simple salts which compose it are of various degrees of solubility in water. The interesting experiments of Graham prove, nevertheless, that it does not resist the influence of large quantities of water, for he actually succeeded in decomposing alum in very diluted solutions, an effect decidedly due to the chemical mass of the water. For a small quantity of the dissolved salt comes, by diffusion, gradually in contact with large masses of water, which effectually assists the decomposition.—*Pharm. Central-Blatt*, No. xxvi., 1851, p. 401.

ON LIQUOR FERRI NITRATIS, U. S. P., 1850; AND ON A FORMULA FOR SYRUP OF PROTO-NITRATE OF IRON.

BY WILLIAM PROCTER, JUN.

THE instability of the so-called "solution of sesqui-nitrate of iron" is proverbial and several attempts have been made to render it sufficiently permanent to be at all times relied on. The formula of the Dublin Pharmacopoeia of 1850, which is virtually that of Mr. Kerr, of Scotland, has been adopted in the United States Pharmacopoeia, with a slight alteration, rendered necessary by the different value of the weights and measures of the two codes. The manipulation is the same, viz., to dilute the acid with about five times its bulk of water, and add it to the iron at once, leaving them in contact until the reaction ceases, which is usually stated at twelve hours. The solution thus prepared, has, after filtration and dilution, a dark reddish-brown colour, and is precipitated black by ammonia, which indicates clearly that the iron is not entirely sesqui-oxidized, and that the solution is a mixture of the proto and sesqui-nitrates of iron.

When this solution is suffered to stand, either in close or open vessels, it gradually becomes opaque, and deposits an ochreous sediment, which ceases after a length of time, whilst the liquid has acquired a much lighter colour, is transparent, and is precipitated in brownish-red flocks by ammonia, without any admixture of black. The ochreous precipitate is probably a basic, or sub sesqui-nitrate, several of which are known to exist, and one of which, according to Grouville (*Gmelin's Handbook*, vol. v., p. 269), has the formula $4 \text{ Fe}_2 \text{ O}_3, \text{ NO}_3 + 2 \text{ HO}$. The proportion of this sub-

salt that will precipitate from the officinal solution, depends on the proportion of proto-nitrate existing in the preparation when filtered from the excess of iron, it being greater as the amount of the proto-salt is greater. If the solution is filtered off from the excess of iron, as soon as the reaction has ceased to be active, it will contain much less of the proto-nitrate, than if the contact continues for a length of time (12 hours). The reason of this appears to be, that a portion of iron is oxidized, and dissolved at the expense of the acid of the ter-sesquinitrate, reducing a part of that salt to the condition of an insoluble subnitrate, which salt is subsequently increased in quantity, at the expense of the proto-nitrate, by its gradual conversion into ter-sesqui-nitrate, which remains in solution, and sub-sesquinitrate, which precipitates.

If, however, instead of proceeding according to the officinal directions, the nitric acid is diluted to the sp. gr. 1.15 and the iron, in the form of iron wire, as card teeth, be gradually added, so that the active reaction nearly ceases after each addition, till it is saturated, and then filtered, a solution is obtained containing a much smaller proportion of the proto-nitrate. If now this is heated gently, and nitric acid is slowly dropped in, stirring after each addition, until the solution yields a reddish brown precipitate with ammonia, the solution is entirely free from the proto-nitrate, and has a much lighter colour. The slight excess of nitric acid that exists in the solution thus prepared, is, therapeutically considered, probably an advantage. Dr. Bache (U. S. Dispensary, 9th edit, page 1008) suggests, that "a permanent solution might be prepared, by dissolving moist hydrated sesqui-oxide of iron, in nitric acid, to saturation." This suggestion, however correct in theory, is not easily practised; because, after sufficient of the oxide is dissolved to form a true ternitrate, the dissolution of the oxide continues, until a large portion of sub-sesqui-nitrate is formed; and, unless the exact proportions of acid and base are used, the operator has no clue to guide him in the process.

The following modification of the officinal direction is offered, as yielding a true sesqui-salt in solution, and of equal strength with that of the Pharmacopœia:

Take of iron wire (card teeth) cut in pieces, an ounce.

Nitric acid (sp. gr. 1.42) three fluid ounces;

Distilled water, a sufficient quantity.

Mix the acid with ten fluid ounces of the distilled water, in a thin wide-mouthed bottle, which should be surrounded by water. Add the iron gradually, about a drachm at a time, waiting until active effervescence has ceased after each addition, before making the next. When all the iron has thus been thrown in, filter the solution through paper, heat it gently in a capsule or flask, and carefully drop in nitric acid, followed by stirring or agitation, until a drop of the solution, tested with ammonia, yields a red precipitate, without any tinge of black. Then add distilled water, until the liquid measures thirty fluid ounces. The solution should have a bright Madeira wine colour.

In a paper by Mr. Augustine Duhamel (*Amer. Journ. Pharm.*, vol. xvii., July, 1845) the author states, that Dr. Hays (of Philadelphia) has been using a saccharine nitrate of iron for several years. In a recent conversation with Dr. Hays, he informed me, that the preparation he uses is a syrup, and does not spoil by keeping; and that it is prepared by Mr. Samuel Simes, to whom he (Dr. Hays) first suggested the protective agency of sugar, in reference to nitrate of iron. All who have made the syrup of sesqui-nitrate of iron of Duhamel, are aware that it will not keep long, and a specimen in my possession exhibits nearly the whole of the iron as a precipitate. On examining Mr. Simes's preparation, it was found to be a thick syrup, of a light greenish colour, perfectly transparent, neutral, and to yield a greenish coloured precipitate with ammonia. These characters at once prove the iron to be chiefly in the form of a proto-salt, protected by sugar. As Mr. Simes declines to communicate his formula for publication, and as the testimony of Dr. Hays is strong in favour of its therapeutic value, I offer the following recipe for making the preparation:—

It requires a particular course of manipulation to dissolve iron in nitric acid, without a large portion passing to the higher stage of oxidation. If, however, instead of adding the iron in divided portions to the nitric acid, we add the nitric acid, more diluted, to the iron in great excess, the acid gradually becomes saturated, the solution has a light greenish colour when filtered, and is precipitated, of a greenish colour, by ammonia. It is necessary for the solution to stand on the iron for several hours after the last addition of acid.

Take of iron wire (card teeth) in pieces, two ounces.

Nitric acid (sp. gr. 1.42) three fluid ounces.

Water, thirteen fluid ounces.

Sugar, in powder, two pounds.

Put the iron in a wide-mouthed bottle kept cool by standing in cold water, and pour upon it three fluid ounces of water. Then mix the acid with ten fluid ounces of water, and add the mixture in portions of half a fluid ounce to the iron, agitating frequently until the acid is saturated, using litmus paper. When all the acid has been combined, filter the solution into a bottle containing the sugar and marked to contain thirty fluid ounces. If the whole does not measure that bulk, pour water on the filter until it does. When all the sugar is dissolved, strain, if necessary, and introduce the syrup into suitable vials and seal them.*

SYRUP OF PROTO-NITRATE OF IRON.

BY W. W. D. LIVERMORE.

SYRUP of proto-nitrate of iron is an improved form, in which the officinal liq. ferri nitratis is at present prescribed by several prominent physicians in this city; and combining as it does the advantages of the proto-salts of iron, with stability of preparation, is destined to come into general use as an active and pleasant ferruginous remedy. I believe no formula for it has yet been published, and as apothecaries have found it both inconvenient and disagreeable, depending upon others to prepare it by some secret recipe, the subjoined may be found a convenience.

R Sulphate of iron, $\mathfrak{z}$ viii.
Carbonate of soda, $\mathfrak{z}$ x.
White sugar, $\mathfrak{z}$ xx.
Nitric acid (sp. gr. 1.42) $\mathfrak{f}$ $\mathfrak{z}$ v., and $\mathfrak{f}$ $\mathfrak{z}$ v.
Boiling water;
Simple syrup, aa q.s

Dissolve the sulphate of iron and carbonate of soda, each in two pints of the water, filter, and add to each solution two ounces of simple syrup. Mix the solutions, and allow the precipitate to subside. Pour off the supernatant liquid, and wash the precipitated carbonate carefully with sweetened water, until the washings have no longer a saline taste. Collect the precipitate upon a fine muslin strainer, and with gentle pressure express as much of the water as possible. Transfer to a porcelain capsule, and add gradually the nitric acid, previously diluted with an equal measure of water. Mix the sugar with the solution, and dissolve over a water-bath, stirring from time to time with a glass rod. When done, the syrup should be made to measure thirty fluid ounces, by the addition of a sufficient quantity of water.

It does not always happen that the apothecary has on hand an acid of known specific gravity, and when this is the case, it will answer to add nitric acid diluted with an equal measure of water to the carbonate of iron, until dissolved, and the solution possesses a slightly acid reaction.

This syrup contains ten grains of dry nitrate of iron to each fluid drachm, and the dose varies from twenty to forty drops.—*American Journal of Pharmacy.*

ON THE PREPARATION OF THE TINCT. FERRI ACET. P. D.

BY MR. THOMAS ARNALL.

THIS tincture frequently undergoes spontaneous decomposition by keeping, when made according to the directions given in the Pharmacopœia, a portion of the iron separating in the form of sesquioxide, leaving the tincture more or less decolourized. This decomposition appears to arise from the iron not becoming sufficiently oxidized by mere drying, especially in operating on large quantities. I have adopted the following modification with unvarying success:—To $6\frac{1}{2}$ drams of sulphate of iron

* This paper was written and read before the Philadelphia College of Pharmacy, before Mr Livermore's paper, following, was received—but as the same result is arrived at by different processes, both are inserted.—Ed. *American Journal of Pharmacy.*

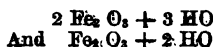
add a sufficient quantity of nitric acid and a little water, and apply heat until a perfectly clear and bright solution of persulphate and permnitrate is obtained; add, if necessary, liq. potass. carb. to neutralize any excess of acid, or until a permanent precipitate begins to fall, then dissolve 13 drams of acetate of potass in the liquid, and carefully evaporate to dryness. Rub the mass with two pints of rectified spirit of wine and filter. The result is a fine dark red permanent tincture. The nitrate of potass formed does not in any way alter the product, it being insoluble in the spirit.

ON THE COMPOSITION OF THE HYDRATES OF SESQUIOXIDE OF IRON,
AND THE EMPLOYMENT OF ONE OF THESE AS AN
ANTIDOTE IN CASES OF POISONING BY ARSENIOUS ACID.

BY M. J. LEFORT.

A NOTICE by Wittstein on the modifications which hydrated sesquioxide of iron undergoes in water, induced me to make some experiments on the composition of the hydrates of this oxide. The subject, although much had been written upon it, required yet further investigation.

Whatever mode of precipitation be adopted, the alkalis furnish with the persalts of iron only two hydrates of the oxide, which are thus represented:—



The former of these is always produced when a hot solution of a persalt of iron is treated with solution of potash or soda also hot. I analyzed this hydrate, when it ceased to give off water on being placed over oil of vitriol, and found 14.82 and 14.55 per cent. of water in it. Calculation gives 14.44. On being heated this hydrate gives off water at 212° Fahr.

The second hydrate is produced when cold solution of potash, soda, or ammonia is added to a cold solution of a persalt of iron. It is less dense than the former, and the colour is not so brown. It begins to lose water when heated to 167° Fahr.

Two analyses of this oxide gave me 18.23 and 18.40 per cent. of water. Calculation gives 18.36.

Several Chemists have assigned formulae to the hydrates of sesquioxide of iron, which are prepared with the carbonated alkalis, either cold or hot. I have prepared the oxide in these ways, and found it to contain from two to six per cent. of carbonic acid.

The last of the two hydrates which I have described above, is used, as is well known, as an antidote in cases of poisoning with arsenious acid.

In reference to this subject, M. Wittstein has represented, that when the hydrated oxide has been prepared for some time, six months for instance, it loses one half of its water, acquiring at the same time a crystalline appearance, and becoming much less soluble in acids than it was when recently precipitated. This statement, if correct, would have a very important bearing upon some of the applications of the hydrated oxide.

With the view of satisfying myself on this point, I examined some hydrated sesquioxide of iron which I had kept under water for three years. On analyzing it, it gave me the same quantity of water as a specimen which had been prepared only a few days. On examining it with the microscope, I could not distinguish any crystalline structure. On being put in contact with weak acids, it dissolved as readily as that which had been recently precipitated.

Some of this oxide, which had been kept for three years, was administered in a case of poisoning with arsenious acid, and it efficiently counteracted the poisonous effects of a large dose of the poison.—*Journal de Pharmacie.*

ON PRESCRIPTIONS ORDERING EXTREME DOSES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—I wish to draw the attention of Physicians, and other members of the medical profession, who are in the habit of sending their prescriptions to a Druggist to be prepared, to a subject in which both parties are equally interested. It now and then occurs that a prescription is received ordering a dose of some powerful medicine, which, though not absolutely poisonous is so excessive, that in the exercise of

a prudent caution the Druggist does not consider himself justified in dispensing it without previous reference to the prescriber. On making the inquiry he frequently finds that no oversight had taken place, but that the case was an extreme one, and required the use of extreme measures, and thus time, which might be an object, is lost in a futile inquiry. Having been subjected to the inconvenience frequently myself, it has occurred to me to suggest a simple, but I think an efficient remedy. Whenever urgency requires the use of strong medicines in doses that might perplex a prudent dispenser, I would suggest underlining the quantity with a dash or two (as 3ij), or some other mark which shall show that such a dose was really intended, and thus relieve the mind of doubt and uncertainty. I do not claim to be the originator of this idea, but having seen it adopted by a medical man in Islington, with the happiest result, I desire to make its advantages more widely known, in the hope that it may meet with a more extensive adoption.

Hoping you will think this worthy of a place in your pages,

I remain, your obedient Servant,

London, Dec. 15, 1851.

A. P. S.

SHEEP DIPPING COMPOSITION.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—In the Pharmaceutical Journal of this month I observe an account of the trial Huggins *versus* Froom, in which you give an abridged report of my evidence. As there is no correct report published of what I did say, I could not expect yours to be otherwise. I, therefore, avail myself of the earliest opportunity of sending you more correct information on the subject. You report,

1. My analysis for Mr. Herapath's.
2. "Putting eight pounds (of Froom's composition) to forty gallons of water, he (Dr. Hulme) was of opinion that arsenite of potash would not be formed."
3. "He (Dr. Hulme) had made baths with a small quantity of each, using the same quantity of water," &c.
4. "In Froom's he found rather more than half a grain of arsenious acid, in the other about a grain."

The following is a correct account.

Putting eight pounds of Froom's composition to forty-three gallons of water, or the same quantity of Bigg's composition to forty-eight gallons of water (the whole of) the arsenious acid would not be converted into arsenite of potash. In proof of which I produced the residue of a bath (Froom's) containing undissolved arsenious acid. That you would not have more arsenious acid in combination with potash than there was arsenious acid dissolved. This I found on analysis to be rather more than half a grain in every fluid ounce in Froom's bath, and about a grain to the ounce in Bigg's. This difference being attributed to the presence of a larger quantity of organic matter in the former diminishing the solvent power of the water. From the way in which the sheep were affected, and the time which elapsed before death took place, the injuries were attributed to the action of powdered arsenious acid left in contact with the skin.

This evidence as well as my analysis of the composition, was in direct opposition to the opinion of the medical witnesses on behalf of plaintiff, who stated that, from their analysis, Froom and Bigg's compositions were alike, containing the same ingredients in the same proportion; and without an analysis, they assumed that in Froom's bath the whole of the arsenious acid was in solution as arsenite of potash, but only partially so in Bigg's, because they considered the arsenious acid in Bigg's composition to be in the form of spicule, and therefore less easily acted on by the potash than the more finely powdered arsenious acid of Froom's. Now, Dr. Shapter and Mr. Tucker considered the injuries arose from absorption, while Dr. Budd attributed the effect to the local action of arsenite of potash. The analysis upon which these contradictory opinions were based were as follows:—

	SHAPTER. FROOM'S.	HULME. FROOM'S.	HERAPATH. FROOM'S.
Sulphur	60	10.75	10.8
Arsenious acid.....	10	11.64	12.0
Potash	12	7.61	7.54
Fatty matter and water...	18	Oil 70.	Oil 69.66
	100	100.00	100.00
	BIGG'S.	BIGG'S.	BIGG'S.
Sulphur	60	22.0	25.62
Arsenious acid.....	10	20.08	19.50
Potash	12	6.56	7.36
Fatty matter and water...	18	Oil 51.36	47.52
	100	100.00	100.00

In respect to the determination of the quantity of alkali in these compositions, Mr. Herapath observes, "I have taken great care to be as accurate as possible, but find the samples are badly mixed, having more alkali in some parts than in others."

In conclusion, I perfectly agree with you that as yet no satisfactory explanation has been given of the different effect of these compositions. I consider it easy to arrive at a correct solution of the question; but as the legal advisers on behalf of the defendant did not consider it of importance the question was not put and it was left unexplained.

I remain, Sir, your obedient Servant,

EDWARD HULME, M.D., &c.

Exeter, December 10th, 1851.

EXETER DISTRICT COUNTY COURT.

Before J. Tyrrel, Esq.

ACTION FOR DAMAGES OCCASIONED BY SHEEP-DIPPING COMPOSITION.—CONCLUSION OF THE TRIAL.)

HUGGINGS v. FROOM.

(Continued from page 283.)

SATURDAY, NOVEMBER 29.

THIS was the day fixed for judgment in the important case as to the liability of the defendant for damage sustained by the plaintiff's sheep, in consequence of their being dipped in a composition sold by him for the cure of tick and vermin, in the fleeces of sheep. Many agriculturists were present, and the decision was looked for with much interest. Mr. Tanner, solicitor, and Mr. Coleridge, barrister, were present on behalf of the plaintiff, and Messrs. Stogdon and Turner for the defendant.

His Honour delivered judgment as follows:—This is the day fixed for giving judgment in this case; it is a case which has occupied a great deal of time, but not one moment more than the importance of it deserves. At the same time, in looking over the evidence, it seems to me that both the facts of the case and the law are comprised within a very small compass. With respect to the law, the action has been brought to recover damages for a breach of contract; and, unquestionably, where there is a good consideration on the one hand, and a contract on the other, the individual so contracting is liable for any breach of it. The only other observations I will make upon the law is this—that every thing that passes at the time of the making of a contract—every representation which is made at that time, forms part of the contract itself. With these observations upon the law, I will state what I conceive to be the facts, as the result of the evidence. It seems that Mr. Froom was the agent, for some time, of a person named Bigg, for the sale of a certain wash, which was used to destroy the vermin in the fleeces of sheep; that in 1849, the agency was discontinued, and that Mr. Froom commenced selling a similar wash of his own. Now the directions given for the use of the two washes were nearly the same, and those directions were followed very closely, but not strictly, by the plaintiff. When I say that they were not strictly followed, I mean, that, for instance, the directions ordered, that each sheep should be kept in the bath for a minute—neither

more nor less—if more it would injure the sheep, if less, it would not destroy the tic. Then the directions ordered that each sheep should be kept a certain portion of time after dipping, before being turned out to pasture; and it appears that the plaintiff did keep a great number of them long enough, before turning them out; but with regard to a few of them, inasmuch as one flock was turned out before another was commenced, it is probable that some of those which were last dipped, in each flock, did not remain in sufficiently long to have their fleeces thoroughly drained. On the whole, however, I consider that the directions were substantially complied with. Now, both Bigg's composition and Froom's were well known to be very dangerous washes, requiring great care in their application. Bigg's however, had been long used by Froom's customers, with comparative impunity, although followed in some instances, with even fatal effects. When selling his own composition—and now I come to the contract upon the part of Mr. Froom—when selling his own composition to the plaintiff, instead of Bigg's, he stated that it would not injure the sheep, if used according to his directions. In both these washes, the active ingredient in destroying the vermin—and the ingredient which eventually injured the sheep—seems to have been arsenious acid, of which there appears to have been a larger quantity in Bigg's than in Froom's. It seems that Mr. Froom was not acquainted with the exact composition of Bigg's wash, and, in endeavouring to imitate it, either from increased trituration, or using a larger quantity of potash, he made a wash more dangerous. Whether that arose from the arsenious acid being rendered more soluble in water from the addition of potash or from other causes, I do not now consider. Some very intelligent Chemists, who have been examined on both sides, differ as to that; but whatever the cause was, of the wash being rendered more dangerous, the fact that it was rendered more dangerous, is unquestionable; for while on the one hand, we find that mortality was a very rare consequence of the use of Bigg's wash, in one season alone, the mortality arising from the use of Froom's, amounted to above 140 sheep and lambs. I think that, in justice to Mr. Froom, I ought to say, that he was not himself aware that his wash was more dangerous than Bigg's. When he represented to the plaintiff that it would not injure the sheep, if used according to his directions, he believed what he stated, to be true, and he may have grounded his belief, not only on the fact of its containing a less quantity of arsenious acid, but also on the fact that he had sold the wash in 1849, without having heard of any complaint from his customers. I think that I am bound to state this on Mr. Froom's account, but it makes no difference whatever in the contract; because whether he knew it or not to be dangerous, if it afterwards turned out to be dangerous, he is answerable. He was bound not to contract in ignorance, whether he knew it or not, and if he did not know it to be perfectly safe, he was bound not to say so. Having, therefore, carefully considered the whole of the evidence, it appears to me in the first place to be established, that Mr. Froom did contract with the plaintiff to sell him a composition of his own, not as being altogether free from danger in its use, but as being as free from danger as that which had been sold under the name of Bigg. It appears to me, further, that Mr. Froom's composition was not so free from danger as Bigg's; but that, on the contrary, it occasioned a greater degree of danger to the sheep which were dipped in it, than had ever resulted from the use of Bigg's in any case. It appears to me further, that if the plaintiff had used greater care in more strictly following the directions given him, the injury might possibly not have been so extensive, and this I shall take into the account in considering the amount of damages. I am also of opinion, that no care which he could have taken—using Mr. Froom's wash in its full strength, and according to the directions given—could altogether have preserved him from a very severe loss; and for that loss, which I look upon as the inevitable result of the use of the defendant's composition, I assess the damages as follows:—For the eleven lambs that died, I give the sum claimed, £1 each; for the ewe that died, also the sum claimed, £1 10s.; I think the flock sustained damage to the amount of £10; and I award 10s. for the farrier. The judgment therefore will be entered for the plaintiff, damages £23.

Mr. Coleridge asked for costs.

His Honour.—The costs would follow the action. He said nothing about witnesses, as he was not asked for them; if they were, he must assess each individual.

Mr. Tanner then asked for the expenses of the witnesses.

His Honour said *Mr. Tanner* must send in the list, and he would look at them.

Mr. Tanner would send them to the clerk.

His Honour was bound himself to tax them. There were several individuals who had a direct interest in the matter, and would not be supposed to ask for expenses. There were others unquestionably who came without any interest.

Mr. Coleridge might perhaps be allowed to state, that the witnesses who had been called, were all necessary to make out the plaintiff's case, even though some were interested, they were substantially necessary.

Mr. Stogdon said, there had been a question of law raised, on which, with the greatest respect to *His Honour*, *Mr. Froom* was not disposed to acquiesce in his adjudication, but would take the case before another tribunal.

— *His Honour*.—Most unquestionably; he had put his judgment in writing for that purpose.

Mr. Stogdon.—It having been stated that there had been no misrepresentation on the part of *Mr. Froom*, certainly gave him great reason to consider that a reconsideration of the case before another tribunal would lead to a different result.

Mr. Coleridge could not permit it to pass that there had been no misrepresentation on the part of *Mr. Froom*.

His Honour had found as a fact that *Mr. Froom* stated that the wash was a safe one, if used according to his directions, and he had found as a fact that it was not a safe one.

Mr. Stogdon.—*Mr. Froom* not knowing it at the time.

His Honour.—The *scienter* does not come into consideration in a question of contract. Addressing himself to *Mr. Coleridge*, he said, the learned gentleman must not think for a moment that it was his opinion that any individual had been called as a witness unnecessarily; but he felt that, inasmuch as several of the witnesses, would, in all probability, be benefitted considerably by the result, he should take that into consideration in assessing the expenses.—*Western Times*.

NOTICES OF BOOKS.

THE LITERARY AND SCIENTIFIC ALMANACK FOR 1852. By J. W. G. GUTCH, M.R.C.S. David Bogue, Fleet Street.

We have for several years had occasion to notice this annual pocket-book, which in a small compass contains a large amount of information useful for reference. The present edition contains, besides the usual tables (Chemical, Meteorological, Chronological, &c.), several practical articles on Photography, Agriculture, and other scientific subjects.

ON IMPROVING THE CONDITION OF THE INSANE. By H. MONRO, M.B., Oxon. John Churchill, Princes Street.

DEATH OF PRIESSNITZ.

PRIESSNITZ, the inventor of hydropathy, died at Graefenberg, on the 26th of November, at the age of fifty-two. He had been for some time suffering from water on the chest, but refused to see any physician, or to try any remedy except his own system, to which he was true to the last.

THE CORRESPONDENCE RESPECTING THE SUSPENSION OF DR. PEREIRA'S LECTURES ON MATERIA MEDICA.

In a letter in our last number, from *Mr. Charles N. Cotton*, one of the *Materia Medica* class (page 287), a list is given of those whose names were not attached to the Declaration disclaiming any participation in the publication of the Lectures, "with the reasons assigned for their not appearing there."

The names of *Mr. Hemingway* and *Mr. Garden* appear among those who refused to sign, without any reason for the refusal being stated. These gentlemen considering that this circumstance might lead to an inference that they had been implicated in the transaction which led to the suspension of the Lectures, have requested the insertion of an explanation of the facts of the case, which are as follows:—

Mr. Hemingway states that such inference, so far as he is concerned, would be quite without foundation, as he has not attended any of the Lectures, and is not, in fact, a member of the class, although his name was by some mistake

placed on the list by the Secretary. On this account, and also because he is a Member of the Council, he had not taken any part in reference to the Declaration.

MR. GARDEN states that he fully concurred in the unanimous resolution of the Council passed on the 13th of November (page 255), deprecating the surreptitious and unauthorised publication of the lectures; that he had not directly or indirectly countenanced their publication, or attempted to screen the parties concerned; that he had not taken a part in preparing or signing the first Declaration because it was addressed to the Council of which he is a member; and that his unavoidable absence from the lecture on the 25th ult. was the sole cause of his name not appearing on the subsequent declaration.

The Editor regrets the insertion of any statement liable to misconception, and gives this explanation in justice to Messrs. Hemingway and Garden, as the Journal was printed before the receipt of any communication from those gentlemen on the subject.

It may be added, that Mr. Bastick and Mr. Dickinson are also members of the Council.

TO CORRESPONDENTS.

Omega. (Hull).—Mr. Picciotto has a patent for his process for purifying gum with sulphurous acid.

B. Y. (London).—As stated in previous numbers of this Journal, vol. x., p. 68, &c., nearly the whole of the quinine is soluble in the tinct. quinae co. P. L.

Chemteus.—The red colour of annatto is changed to yellow by the addition of an alkali.

Egomel.—(1.) Nostrums are sometimes sold under the name of "absorbent powders for indigestion." The Spanish Pharmacopœia contains the following: R Magnes carb. ʒi, sodæ sub-carb., excic. ʒj., P. Zingib ʒ ii. Sometimes a little chalk is added.

—(2.) There is no official formula for "citrate of iron and quinine draught." The dose is about 5 grains.—Infusion of orange-peel, with a little syrup, is a good vehicle.

(3.) Tannin dentifrice is sometimes made with ʒss of tannin to ʒj of precipitated chalk.

—(5.) Mr Halse, 22, Brunswick Square.

N. S. W. (Carlisle).—Yes.

Josephus. (Novagent).—Oxide of silver dissolved in a solution of cyanide of potassium. Chalk, mixed with this solution, to the consistence of cream, is used, under the above name, for renovating plated goods.

R. I. M. (Brighton).—We believe the work is in progress, but it may be several months before it is completed.

Inquisitor.—We shall take an early opportunity of giving the definite and satisfactory answer which our correspondent desires.

Delta. (Leicester).—Yes.

Mr. Car.—The subject is not within our province.

D. W.—(1.) Add a little hydrochloric acid (free) to the evaporated liquor, before putting it to crystallize.—(2.) Cinnamic acid has no smell, and therefore the smell of tar could not arise from its presence.

C. H.—The process for dyeing buff, or any other colour, depends upon the nature of the substance to be dyed. We do not profess to give practical instructions in this art.

E. R. S.—No; not according to the usual acceptance of the term.

A. H.—(1.) It has not been stated, and we do not know what the wires are composed of, but believe they are both alloys.—(2.) The quantity is 5 drachms, and not 5 ounces.

An Associate.—Crocus of antimony is a mixture of sulphuret and oxide of antimony, obtained either by deflagrating the sulphuret with nitre, or by merely roasting.

Sigma.—The proposed solution would probably answer the purpose required.

Amicus.—(1.) Phillips's Translation of the Pharmacopœia.—(2.) We cannot explain the cause of failure without knowing more particulars of the construction of the apparatus.

E. N. T.—An indenture is not necessary. There is no alteration in the course of examination.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho.

Other communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. VIII.—FEBRUARY 1st, 1852.

THE MEDICAL REFORM BILL FOR SESSION 1852.

A DRAFT of this Bill has just appeared under the auspices of the Provincial Medical and Surgical Association.

It provides for the appointment of three Medical Councils for England, Scotland, and Ireland respectively. The constitution of the said Medical Councils is similar to that of the Council of Health, proposed by Sir James Graham in his Medical Bill.

These Councils are to elect their respective Presidents and Vice-Presidents, and also to appoint Examiners, Registrars, and other officers. The places of meeting are to be the buildings of the Colleges of Physicians in England, Scotland, and Ireland.

All Medical Practitioners producing diplomas, &c., before 1st of February, 1853, proving that they were in practice, and duly qualified, prior to 1st of Nov. 1852, are to be registered on payment of a fee of 5s. Future Practitioners are to be examined prior to registration on payment of a fee of £10. Powers are vested in the Council to modify the regulation in favour of Students of a date prior to the passing of the Act. The registration is to be renewed annually on payment of 20s.; half the monies received under the Act are to be applied to defray the expenses of carrying the Act into execution, and the remainder to the formation of a Medical Provident Fund.

The Act is not to interfere with the existing rights of the Colleges of Physicians and Surgeons in granting degrees, which degrees will be honorary, and qualify the possessor for holding corresponding appointments in public institutions. Registration under the Act will confer the legal power to practise Medicine, Surgery, Midwifery, and Pharmacy. Only registered Practitioners will be able to recover charges for attendance, &c., or to hold medical offices in public institutions.

The following is the clause restraining unregistered persons from practice:—

“If any person shall, after the first day of February, 1853, act or practise as a Physician, Surgeon, Apothecary, or Licentiate in Medicine, Surgery, and Midwifery, in any part of the United Kingdom, without being duly registered under the provisions of this Act, and without having a certificate as aforesaid, in force at the time of his so practising, or acting as a Physician, Surgeon, Apothecary, or Licentiate in Medicine, Surgery, and Midwifery, he shall, on conviction before any magistrate having jurisdiction in the county, city, or place where the offence was committed, forfeit and pay a sum not exceeding £5, nor less than 40s., for every such offence, to be recoverable within three months next after the commission of the said offence.”

In the thirty-sixth clause it is provided

“That, not anything in this Act contained shall extend, or be construed to extend, to prejudice, or in any way to affect, the trade or business of a CHEMIST and DRUGGIST, in the buying, preparing, compounding, dispensing, and vending drugs, medicines, and medicinal compounds, wholesale or retail, without the giving of medical or surgical advice.”

Penalties are provided for the unauthorised assumption of titles, and for other frauds, and power is vested in the Medical Councils to expel from the register persons guilty of disgraceful conduct.

All penalties are to be paid to the Medical Council for that part of the kingdom in which the offence takes place.

The only novelty in the Bill consists in the appropriation of one moiety of the

funds to the formation of a Medical Relief Fund. In other respects, it is composed of a selection of old materials, culled from previous Bills, and dovetailed together, *secundum artem*. Among the fragments of the numerous Bills which have been launched and wrecked since the date of Mr. Warburton's Committee (1834), ample materials might be found for the construction of one which would weather the storm. The difficulty consists in the proper distribution of the ballast. A ship, in which the ballast is all on one side, could not live in a rough sea. This, figuratively speaking, has been the cause of so many wrecks in the tempest of Medical politics.

The Bill before us is not yet finished. The interpretation clause is "to be inserted when the Bill is completed." This clause may materially affect the Bill in its influence on the interests of Chemists and Druggists. In its present form it might be premature to pass sentence, as it is only issued as the draft of a Bill, and will require amendments. We may, however, observe, that the Bill as it now stands, unless accompanied by a Pharmacy Bill, would clip the wings of the Chemists and Druggists, without leaving them a leg to stand upon. The course to be adopted in reference to the Bill must, therefore, depend upon circumstances.

THE PHARMACY BILL.

Our readers will recollect that this Bill was withdrawn with the understanding that the subject was to be referred to a Select Committee early in the ensuing session. In the present uncertain state of political affairs, with the prospect of an early dissolution of Parliament, it would be useless to speculate respecting the prospects of any Bill about to be brought forward. We need only state that in spite of the obstacles and delays which have occurred, we are not discouraged, and only wait for the proper opportunity to proceed with renewed vigour.

THE LIBRARY OF THE PHARMACEUTICAL SOCIETY.

THE comparative advantages of a library for reference and a circulating library were fully considered at the time the Society was established, and it was the general opinion that sooner or later both these objects should be secured. It was, however, determined in the first instance to encourage the attendance of Members and Associates in the library, and to defer the circulation of the books until experience should point out the existence of a demand for this accommodation, and justify the enlargement of the library for that purpose.

So long as the library contained only one set of books, it was obvious that the two objects—reference and circulation—would clash, for this simple reason, that in proportion to the extent of the circulation out of doors, would be the chances of disappointment to the visitors in the library. It was therefore in contemplation, in the event of a demand arising, to provide duplicate copies of the works to be circulated, and thus to effect the second object without interfering with the first.

Notwithstanding the endeavours which have been made to adapt to the convenience of the Members and Associates the arrangements of the library and the hours during which it is accessible, a very small number have availed themselves of its advantages. This has led to the reconsideration of the subject by the Council, and the adoption of the regulations contained in another part of this number (Transactions of the Society, page 344). In arriving at this decision, the Council have been influenced by the belief that there are many Members and Associates whose business engagements do not admit of their attendance at the library, but to whom the opportunity of reading the books at home would be duly appreciated; and although the value of the library for purposes of reference will be in some degree impaired, the change is

considered to be beneficial to the majority at the expense of only a small minority.

It will be seen by the regulations that some works are excluded from circulation: these are chiefly expensive and voluminous works, or those which could not be replaced if damaged or lost. If inconvenience should be found to arise from the new arrangement, or if it should occur that some works are in general requisition by several persons at the same time, this may be obviated by the purchase of additional copies, in accordance with the demand. We hope the experiment will be attended with the desired result. It is the object of the Society to afford every facility for improvement and the extension of knowledge, for which purpose it is necessary from time to time to modify the laws and regulations as experience dictates or circumstances require.

THE SUPPLY OF MEDICINES TO EMIGRANT VESSELS.

In our number for March, 1851 (Vol. x., No. 9), we gave an abstract of the regulations issued by the Board of Trade, under the 7th and 8th Vict., cap. 112, sec. 18, and the Mercantile Marine Act, sec. 64, for the supply of medicines to merchant vessels. The supply to emigrant vessels is regulated by Her Majesty's Land and Emigration Commissioners, and we are induced to advert to this subject on account of circumstances which have recently occurred in reference to the source of supply and the quality of the medicines furnished.

The following is the LIST OF MEDICINES, &c., required for every 100 persons.

N.B.—The medicines, &c., must be procured from the Apothecaries' Hall. All the volatile medicines and acids to be put in stopper bottles.

lb. oz.		lb. oz.	
0 1	Acet. colchici	0 1	" Opii. purif.
0 8	Acid acet.	0 2	Ferri. sulph.
0 1	" citric.	0 4	Gentian radix
0 1	" Hydrocyanic. dil. Ph. Lond.	0 1	Hydrag. c. cretâ
	carefully marked Poison	0 1	" chlorid.
0 2	" Hydrochlor. { Carefully packed	0 ½	" bichlorid.
0 2	" Nitric. dil. { in a small case,	0 1	Iodid potassi
0 6	" Sulphur dil. { with sand	0 8	Liniment saponis
0 12	" Tartaric	0 8	Liquor ammon.
0 2	Ammon. sesquicarb.	0 1	" Potassæ arsenitis
1 0	" Muriat.	0 8	" Plumbi acet.
2 0	Amylum.	42 0	Magnesiæ sulph.
½	Antimon. potassio-tart.	0 4	" Carb.
0 ½	Argent. nitras.	0 ½	Morphæ acetat.
0 8	Bals. copaibæ.	0 8	Ol. lini sem.
1 0	Calx. recens.—in stop. bott.	0 ½	" Menth. pip.
0 6	Camphor	2 0	" Olivæ
2 0	Cerat. cetacei	6 0	" Ricini opt.
0 8	" Calaminæ	0 3	" Terebinth. pur.
0 8	" Resinæ	0 ½	" Tigllii croton
0 2	Conf. aromat.	0 6	Pil. hydrarg.
1 0	" Sennæ	0 1	" " Chlor. comp.
0 1	Cupri. sulph.	0 4	Plumbi. acetat.
0 12	Emplas. lyttæ	1 8	Pulv. acaciæ gummi.
0 8	" Plumbi	0 8	" Aluminis.
0 4	" Resinæ	0 ½	" Antimonii comp.
0 ½	Ext. aloes. purif.	0 ½	" Cinnam. comp.
0 4	" Coloc. comp.	0 1	" Cretæ comp.
0 ½	" Conii	0 8	" " Prep.
0 ½	" Hyoscyami.	0 4	" Ipecac.

We attribute much of the evil to the system which is adopted for obtaining medicines for shipping. This is not unfrequently done by contract, through parties who undertake to furnish stores of all descriptions. These contractors are only partially responsible, as they are not supposed to be personally conversant with the quality of every article supplied, and in the purchase of medicines they throw the *onus* on the Druggists, binding them down to the lowest possible terms. Whatever they can save on the drug account increases their profit on the general contract. This cutting down of prices has been carried to the greatest extent in the supply of emigrant vessels, in which economy is a primary consideration. We have been informed that contracts for medicines have been taken as low as 1s. or 1s. 3d.^a a head on the number of passengers. It is not possible that a chest or chests for 100 persons, with bottles, jars, measures, apparatus, &c., could be furnished for £5—an amount which would scarcely cover the cost of the packages, glass, and et ceteras, exclusive of the medicines themselves; and when a contractor, or “middle man,” induces a Druggist to take such an order for the sake of securing a connexion, and in the hope of profit on future transactions, he cannot expect to be supplied with genuine medicines on these terms. Business of this description is only taken by those who cannot resist the temptation of “turning a penny”—a class of persons called into requisition by the demand for drugs at prices bearing no relation to their value, if genuine.

It is, therefore, not at all surprising, that some of these contracts have been executed in a discreditable manner. In the first instance, the Commissioners depended on the general interests of the shipowner to deal with a respectable house, and on the inspection of the medicine by the emigration officer, and medical inspector, prior to embarkation; but cases having occurred in which this security was found to be ineffectual, it was necessary to adopt some other precautions. Whether it was necessary to resort to a monopoly as a security against fraud, is the question now under consideration.

As a general rule, purchasers have the option of obtaining goods where they think proper. This applies to public bodies, as well as to individuals, subject to the condition, that those who purchase on behalf of others, protect the interest of the parties for whom they act. Medicines are furnished to the army by three responsible houses, who perform the duty in rotation. No other person has a right to complain that he is not the party selected. The appointment rests with the Government, the work is well performed, and there is no ground for complaint. Hospitals, dispensaries, and some workhouses, are supplied with medicines by tender—samples, with the prices, being sent in by several Druggists, and examined by a Medical Committee who make the selection. This practice secures the advantage of competition in quality as well as in price. The Land and Emigration Commissioners do not purchase medicines; they merely require, on behalf of the emigrants, that certain medicines, of good quality, shall be supplied to every vessel chartered by them. If the captains, and the Druggists whom they employ, performed their duty, the Commissioners would not interfere; but *some* of the captains, and *some* of the Druggists, having betrayed their trust, *all* the captains are compelled to go to Apothecaries' Hall, and *all* the Druggists are placed under a ban. The Commissioners consider that it would be invidious to make a selection of any private establishments for the exclusive use of shipowners; they object to the responsibility of deciding as to the merits of individuals, and decline to incur the liability to frequent appeals from parties desirous of being placed on the list. They therefore include all the Druggists in “Schedule A,” and thus avoid the appearance of partiality or favouritism. The Commissioners being responsible for the proper fulfilment of the contracts, are in the position of purchasers, having discretionary power to decide as to the source of supply. It is, however, satisfactory to know, that they have no desire to enforce a monopoly, or to interfere with the just rights and privileges of the drug trade. In the performance of a public duty they have adopted the means

which appear to them to be necessary for securing the object in view ; but, if it could be shown that this object could be secured by means less harsh and exclusive, there is every reason to believe that they would be disposed to reconsider the subject.

Many Druggists have set their faces against the ruinous contract system, which is the origin of the existing abuses. It is the interest of *all parties* to discountenance it, and to transact business on fair and honourable terms. Unfortunately, some persons are influenced by a short-sighted policy, by which they ultimately suffer—as the shipowners have done in the present instance, being driven from the extreme of the “cutting system,” to the opposite extreme of “monopoly charges.” Those who are desirous of upholding the character of the drug trade, should unite in their endeavours to expose and discourage the system by means of which the delinquencies of some individuals have brought all into discredit. After what has occurred, apathy would imply assent. The precedent, if passed over without notice, will be followed by other innovations subversive of the character of Chemists and Druggists. The abuses which are alleged as the motive for establishing the monopoly are either the *exception* or the *rule*. If the rule, we must submit to a merited disgrace, and introduce a complete reform before we can hope for redress ; if the exception, the evil should be probed to its source, and the truth established. It is useless to shut our eyes to facts, or to shrink from an inquiry, in the apprehension that it may possibly lead to humiliating disclosures. As a class we stand impeached, and our legitimate functions as Druggists are transferred to a Company of Apothecaries. Are we guilty or not guilty ? The *onus probandi* rests with ourselves. By collectively repelling the allegation, and discountenancing the practices on which it was founded, we shall pave the way for the establishment of our position as honest Druggists, capable of supplying emigrants with medicines.

PRESERVED MEATS FOR THE NAVY.

THE recent disclosures respecting the meat supplied by contract to the Government for the use of the navy, affords an unprecedented example of human depravity. Out of 2707 canisters, each containing, on an average, ten pounds of meat, which were opened during four days at Portsmouth, only 197 were found to be fit for human food. Those which were condemned consisted chiefly of pieces of heart, liver, roots of tongues, ligaments of the throat, intestines, coagulated blood, and garbage of the most offensive description, in a putrid state. The examining Board deemed it prudent to desist from their labours for a week, as a precaution against the probable consequences of a prolonged exposure to such a mass of putrifying animal matter, which had been warranted, by the contractor, to keep sound and fit for use, as human food, for five years. On resuming the investigation, the examiners found that the remainder of the canisters, above 6000, were no better than those previously opened, about fourteen-fifteenths of the whole consisting of similar materials, in a state of putrefaction.

A large proportion of these corrupt meats were obtained from a contractor at Moldavia ; and statements made by several naval officers, and others, afford reason to believe that the abuse has prevailed to an extent which would not be credited in the absence of positive proof.

So flagrant an offence, and one so palpable to the senses, is even more surprising than a similar dereliction of duty in the supply of drugs, the sensible properties of which are less obvious, and might possibly escape notice, until found on trial to be inert. The crime, in both cases, is the same, and requires similar precautions for its prevention ;—namely, vigilance on the part of the inspectors, and the selection of respectable contractors, in whom confidence

can be placed. Ample security for the due performance of the contracts should be required, and severe punishment inflicted on the perpetrators of atrocities like those above mentioned. A heavy fine might be a sufficient security against negligence, but an offence involving the wilful sacrifice of human life, demands a much more rigorous punishment.

On comparing the loose manner in which the navy contracts have been arranged and superintended, with the recent regulations of the Emigration Commissioners, the contrast is worthy of remark.

The Government, in the purchase of meat for the navy, employ a foreign contractor, who is under no control, and beyond the reach of justice; the Emigration Commissioners, in regulating the supply of Medicines for Emigrants, discard contracts altogether, and vest a monopoly in a Joint-Stock Company. In the former case guilt enjoys immunity from punishment. In the latter the innocent are punished with the guilty.

THE ADULTERATION OF DRUGS.

WHILE the foregoing subject was under consideration, we received the *American Journal of Pharmacy* for January, which contains a report of the proceedings of the convention of Pharmacutists and Druggists, published in another part of this number (page 374).

The primary object of the convention was the consideration of the best method of preventing the importation and sale of adulterated or damaged drugs. In our number for September, 1848 (Vol. viii., No. iii.), we gave an abstract of the report of a select committee appointed by the Congress in the United States to inquire into this subject, with the Act which was passed in consequence of the said report.

It appears that our brethren in the United States are following up this measure with energy, determined that no effort on their part shall be wanting to rescue their profession from the disgrace, and protect the public from the consequences, of the system of adulteration which had previously prevailed to a considerable extent in that country. As a means of promoting the desired reformation, and raising the character of the Pharmaceutical Chemists, it is proposed to establish local Societies throughout the United States, to co-operate with the Colleges of Pharmacy in New York and Philadelphia.

A movement of this kind is a remedy directed to the root of the evil. It is undertaken by the parties who are especially interested in the result for the sake of their own characters, and responsible to the public as representatives of the pharmaceutical profession.

The measures adopted for preventing the importation of adulterated drugs and medicines have already been attended with considerable success. Many parcels of spurious or inert barks, sophisticated iodine, quinine, and other imports have been rejected by the inspectors. Experience and the further completion of the arrangements will facilitate the detection of fraud, and diminish the circulation of inferior drugs. The attention thus officially directed to the subject will tend to encourage additional care in the preparation of medicines; and the exertions of the College of Pharmacy will promote the double object of improving the standard of education and the quality of the drugs in general use. In proportion as this is effected, the character of the pharmaceutical Chemists will be raised, and the necessity for external jurisdiction or interference removed.

TRANSACTIONS

OF THE PHARMACEUTICAL SOCIETY.

At a Meeting of the Council, held January 8th,

MR. HENRY DEANE, VICE-PRESIDENT, IN THE CHAIR,

the following Resolution was passed:—

“That the annexed Rules for the circulation of the books of the library of this Society amongst the Members be adopted, and that the Librarian be directed to issue books in accordance with these Rules, on and after Feb. 1, 1852, and that these Rules be published in the Transactions of the Society.

“ LIBRARY OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

“ *Regulations for the Circulation of Books.*

“1. The Library shall be open from HALF-PAST NINE until FIVE o'clock daily, excepting Saturdays, and the period during which it is closed for annual revision.

“2. Members of the Society may obtain books on making personal or written application for them; but no Member shall have more than two volumes at a time, nor shall he keep any book for a longer period than fourteen days. But when a book is returned by a Member it may be borrowed by him again, provided it has not been bespoken by any other Member. Books which have been bespoken shall circulate in rotation according to priority of application.

“3. The scientific journals shall not be circulated until the volumes are completed and bound. Works containing valuable plates, and a few standard works of reference, which are distinguished in the Catalogue by a mark (*), shall not be circulated.

“4. Members retaining books longer than the specified time shall be subject to a fine of One Penny per day for each volume so retained. If any book be retained by a Member for three months, and be not returned after written application has been made for it, the Council may order it to be replaced, and charge the Member in default with the amount thus incurred in addition to the fine. If any book, when returned by a Member, is found to have been damaged, during the period such Member has had it, a fine equivalent to the injury shall be paid by the Member.

“5. The Library shall be closed for a fortnight once a year, to admit of the revision of the books.”

BOARD OF EXAMINERS FOR SCOTLAND.

(*Regulations adopted by the Council on the 3rd of December.*)

1. The number of Examiners for Scotland shall be Eight, exclusive of the President and Vice-President of the Society, who shall be Members of the Board, *ex-officio*.

2. The Examiners shall be nominated Annually, at a General Meeting of the Members of the Pharmaceutical Society resident in Scotland, to be summoned by circular, advertisement, or both—ten days notice being given. The Meeting to be held in Edinburgh, and to take place on the first Monday in May.

3. The names of those who are so nominated shall be transmitted to the Council for approval and appointment.

4. The Board shall sit in Edinburgh four times in the year, or as often as may be required.

5. The Names of Candidates who have passed the several Examinations, shall be transmitted to the Council for Election as Members or Associates, and for publication in the Transactions.

Read (January 8th) the following Report:—

"At a Meeting of Committee held in Edinburgh, on the 22nd day of December, 1851, the Resolution of the Council of the Pharmaceutical Society in London, of 3rd December, 1851, approving of the appointment of a Board of Examiners in Scotland, to sit in Edinburgh, as fully expressed in a series of Resolutions adopted at a general Meeting of the Scotch members, was read, and the following proposals approved of, and which are now submitted to the Council for consideration:—

"That the Society in London advance, from the general fund, a sum of £25, to be expended by the Society here, in the purchase of glass cases, trays, bottles, &c., requisite for the commencement of a Museum, and otherwise to assist the Committee, in arranging matters connected with the Examination of Members and Associates; and that the Council in London be requested to favour this branch of the Society, by forwarding any duplicate specimens of Drugs, &c., which may have accumulated on their hands. Further, that, for the first year, the sum of £20 be allowed for current expenditure connected with rent of rooms, Meetings, &c., belonging to the Examinations forthwith to be held; and that the future sum or sums for this purpose be regulated according to the circumstances of the Society in Scotland.

"JOHN MACKAY, *Secretary.*"

It was resolved,

"That the Report of the Edinburgh Committee for the establishment of a Board of Examiners for Scotland be received and adopted; and that the Treasurer be requested to transmit to Mr. Mackay £25, and the Secretary to transmit such specimens that can be spared from this Museum."

It was further resolved,

"That Messrs. Baildon, Duncan, Davenport, Gardner, Macfarlane, Mackay, Robertson, of Edinburgh, Mr. Smith, of St. Andrew's, and the President and Vice-Presidents of the Society (*ex officio*) be appointed Examiners for Scotland, to act until the General Meeting in 1852."

G. W. SMITH, *Secretary.*

LIVERPOOL CHEMISTS' ASSOCIATION.

A COUNCIL Meeting was held on the 27th Nov., 1851, at which the following officers were elected for the year:—

MR. SHAW, *President*; MR. SUMNER, *Vice-President*; MR. ED. EVANS, *Treasurer*; MR. ABBAHAM, *Secretary*; MR. EDWARDS, *Teacher of Practical Pharmacy.*

On the 12th Dec. a Pharmaceutical Meeting was held, the President in the chair, at which Mr. T. C. Archer delivered a lecture on the *Materia Medica* products of the Great Industrial Exhibition of 1851, of which the following is an abstract:—

Notwithstanding the great expectations raised at the commencement of the Exhibition respecting the development of raw products, generally, little more could be said to have been done than giving an additional stimulus to this branch of scientific research, the importance of which needs no further proof than its recognition by scientific men—such as Professors Playfair, Royle, Hooker, Lindley, Forbes, Owen, Ansted, Wallich, &c. With one exception, these learned men were all on the commission; nevertheless, the traces of their labours are not very conspicuous in the arrangement of the raw products of the Exhibition.

We looked to find, not only a careful and comprehensive arrangement, but precise and correct information respecting the articles shown: in this particular the Exhibition was most unsatisfactory. An immense variety of articles were exhibited, which were, no doubt, valuable and interesting, but, owing to the absence of any other information than the local designation, their importance was lost to the visitor. It was not to be expected that every article would be shown correctly designated and named, because our ignorance of the history of a large proportion of the raw products, which constitute the objects of commercial enterprise, is too well known to admit of such an expectation; but a very large proportion of those articles, which

are known to science, were either left nameless, or incorrectly named, thereby rendering them worse than useless to the student. The cause of all this is easily explained—want of time, and the impossibility of pursuing anything like studious investigation, amid the dazzling splendour and excitement of the Great National Exhibition. The consequence was, that many collections were sent by persons anxious to contribute to the interest of the Exhibition, but not competent to name correctly the articles they sent, which were suffered to remain, with their erroneous designations, from the inability of the Committee to grapple with the vast mass presented for their supervision.

In glancing over the collection there were not many novelties in the department of *Materia Medica*; some, however, may be worth mentioning, and will, at least, serve to refresh the memory as to their existence—thus: There were several specimens of the Brazilian vegetable wax, which, though often called *Myrtle-wax*, is totally different, being the produce of a Brazilian palm (*Corypha cerifera*), the *Carnauba* of South America, whereas the *Myrtle-wax* is the produce of a Chinese myrtaceous plant. Another species of vegetable wax was in the magnificent Indian collection, formed by Dr. Royle, supposed to be the produce of a species of *Dipterocarpus*, from Singapore: these would, probably, be very useful in the formation of *Emplastra*.

Vegetable tallow, from the seeds of *Croton sebiferum* (*Euphorbiaceæ*), a native of China, and a purgative oil from *Jatropha Curcas*, now become an important article of commerce, extensively used as a substitute for olive-oil in dressing cloth, and used also in increasing the purgative properties of castor-oil for the manufacture of capsules. The products of two species of *Nectandra* (*Lauraceæ*), one the well known Green-heart wood of Demerara, *Nectandra Rodiei*, from which is obtained the vegetable principle called *Beeberine*; the other, *Nectandra Puchury*, which furnishes the curious seeds called *Sassafras* nuts, or *Pichurim* beans.

The bark called Brazilian Clove-bark, was also worthy of notice, as from its name it is apt to be confounded with Cinnamon Clove-bark (*Cinnamomum culilawan*). The Brazilian species is derived from *Dicypellium caryophyllum* (*Lauraceæ*), it is in thick compact quills, about one inch in diameter, and usually bound round with a kind of rush of the thickness of common twine; its use is chiefly for the adulteration of ground spices.

For the same use the wild nutmegs of Madagascar are imported, and were exhibited; they are derived from *Agathophyllum aromaticum* (*Myrtaceæ*).

Amongst the gums, gum-resins, &c., may be enumerated the following from Australasia: Kauri gum from the Coniferous tree *Damara Australis*; Yellow-gum from *Zanthorrhæa hastilis*; the tree-lily of New Zealand, used as a substitute for Gum Benzoin in veterinary pharmacy; Kino, from *Eucalyptus globulus* (*Myrtaceæ*); Manna, from another species of *Eucalyptus* *E. Mannifera*; and a fine sort of Gum-Acacia, from two species *Acacia dealbata* and *A. mollissima*, almost equal in quality to *A. Arabica*.

From British Guiana was a sample of Grains of Paradise, superior to that from Africa.

From India, the Labiate herb, *Patchouli* or *Pucha-pat*, used only in perfumery; the valuable pure bitter, *Chiretta* (*Agathotes chirayta*) a gentianaceous plant of valuable qualities, but not sufficiently known and appreciated; and, from Northern Africa, the much-esteemed anthelmintic Kosso (*Brayera anthelmintica*):—these and several other matters were described during the lecture.

Mr. EDWARDS, after exhibiting a spirit lamp upon the principle of Soyer's magic stove, brought under the notice of the Meeting the subject of the prosecutions of Chemists for selling certain medicines without a stamp. He believed six or eight Liverpool Druggists had been fined. He had nothing new to communicate, but he thought it desirable that Chemists should be reminded of the law on the subject, and for that purpose he read several of the articles which have appeared during the last few years in the *Pharmaceutical Journal*, and the answers of the Solicitor to the Board of Excise with respect to certain labels submitted to him.

A discussion ensued, and the general opinion appeared to be that the law was a nuisance, and a trap in which all were liable to be caught.

The SECRETARY thought that its abolition would multiply nostrums and

quackery, 'but it was contended by others that the stamp sanctioned the quackery.

On the 9th January, 1852, a Pharmaceutical Meeting was held, at which Dr. Brett delivered a lecture on iron and its compounds. He exhibited numerous specimens of the ores of iron, described the mode in which the metal is obtained from them, and the properties of many of its salts.

Mr. Mercer exhibited a portion of the wires coated with gutta percha, &c., used for the sub-marine telegraph between Dover and Calais, and described at length the process by which it is obtained.

ORIGINAL AND EXTRACTED ARTICLES.

ON THE ZEA MAYS AND OTHER CEREALIA OF WESTERN AFRICA.

BY WILLIAM F. DANIELL, M.D., F.R.G.S.,
Assistant Staff Surgeon, &c.

AMONG the vegetable products cultivated by the natives of the maritime countries of Western Africa, may be enumerated the maize or Indian corn, a plant which occupies no unimportant position in public estimation. Found more or less plentiful in most of the parts frequented by European merchants, it is frequently included with other vegetable supplies furnished for the shipping, and sometimes exported in large quantities to other lands for a variety of purposes. It would appear, in the first instance, to have been reared more for the object of varying that constant uniformity of diet, peculiar to the social condition of the African races, than as a commodity for sale, unless on the Gold Coast and the Bight of Benin, where its growth is zealously fostered, and its value more profoundly appreciated from the fact that nearly four-fifths of the people are often dependent on its production for their daily sustenance. Rendered, therefore, subservient to the wants of the inhabitants by different modes of dressing, and other culinary processes, it has deservedly gained their grateful estimation, both for nutritious properties, and the prolific harvests annually afforded, which have had the effect of imperceptibly superseding most of the farinaceous food of ancient usance. Distinguished by these evidences of popular favour, established on the basis of its paramount utility, a few remarks connected with its history and appliances may not be destitute of interest.

Like the cocoa-nut, orange, and pine-apple, it is not indigenous to the African coasts, but owes its introduction to the Spanish and Portuguese voyagers, who, in the sixteenth century, carried on an extensive traffic with the West Indies and their South American colonies. Since that date it has become naturalized in almost every known district of intertropical Africa, and has passed from thence to the remoter regions of the interior. The fetishmen and other trustworthy authorities, on whom reliance can be placed with reference to their aboriginal customs, concur in stating, that prior to the visits of the white traders it was known to their immediate ancestors. Ample illustrations might be adduced to corroborate the truth of these assertions, even from a casual investigation into the character of some of their fetish rites, in the consummation of which they specially retain the native cerealia, while the zea and other vegetables, originally of foreign derivation, are as stringently prohibited.

Barbot informs us that the maize was first brought to the Gold Coast by the Portuguese, from the island of St. Thomas, in the Bight of Biafera, where it was designated by the term *milho grande*, in contradistinction to the smaller seeds of the *Penicillaria spicata*, abundantly grown on the continent, and named by them *milho pequeno*. Shortly after its importation, the prominent superiority of this grain was soon manifest in many of the country farms, from the propitious nature of the soil and the continued fecundity and bountiful increase of their crops,

which rapidly led to its propagation throughout many of the circumjacent territories, where large cargoes were obtained, carried to the outports, and vended to the commercial factories and slave ships. During the time of peace, and in those days so cheaply could this produce be purchased, that a thousand stalks might be procured without difficulty for the moderate sum of five shillings, and in other places at a third or fourth part less. Since then it has thriven remarkably well and without a single drawback.

Undoubted proofs have remained to attest that the maize was indigenous to both continents of America, and was sown in considerable quantities by the Aztecs and ancient Peruvians, by a systematic husbandry, long in vogue before the Spanish conquests, and converted then as now into a number of useful conveniences, that formed in fact the staple support of their redundant populations. The origin of the word *mays* has been ascribed to the Carribean appellation *mahiz*, an aboriginal expression, which has doubtless been transferred from one of this group of islands. Several of the Spanish historians and naturalists have bestowed great labour and research on the natural history of the new world, particularly Hernandez, who has compiled an elaborate memoir on the vegetable products employed as food by the native races at and briefly after the epoch of their subjugation. The most valuable to which he refers is this corn prepared into a diversity of bread stuffs in multiform compounds, some of which are said to be identical with those in common use among the modern Mexicans, and denominated in Indian parlance *tertullias* and *atolles*. The flour of the former, before its conversion into these well-known cakes, is slightly flavoured with limes and a tinge of pepper, with these the primitive tribes also incorporated various medicinal herbs, they, as perhaps the Chilis, being probably intended to avert the bad effects of that constipating influence, thought to result from its general prevalence, and of which the negro races of Guinea are fully cognizant. The *atolles* were smaller cakes moulded from the admixture of a finer meal with water, and sweetened formerly by a pleasant flavoured sugar extracted from the stalks of the same plant, but now by the juice of the sugarcane, or which is perhaps preferable, with delicious honey from the *tierra caliente*. From the numerous varieties of the maize ascertained to exist in every inhabited region of the American continent, a selection was made of the finest by the aboriginal Peruvians for their religious festivals and sacrifices, the best of which they called *canem*, to separate it from another termed *canta*, that served for their ordinary bread.

It would be superfluous at present to enter into the botanical details of a plant so celebrated in every quarter of the globe, an abbreviated description being all that is deemed requisite.

ZEA MAYS: Linn., *Maize or Indian Corn*. Class Monœcia, Ord. Triandria, Nat. Ord. Gramineæ.—*Root* annual, of innumerable fibres. *Stem* erect, somewhat branched, round, stout, jointed, leafy, from five to ten feet high. *Leaves* entire, sheathing, lanceolate concave, acute ribbed, two or three feet long, and three or four inches broad. *Male* flowers in numerous aggregate terminal spikes, each three or four inches long, greyish, downy, with purple anthers. *Female* flowers below, in a generally simple cylindrical spike, covered by the large sheaths of the upper leaves. *Styles* six or eight inches long, very numerous, of a shining yellowish or reddish hue, hanging down like a long silken tassel. *Seeds* white, yellow, red, or purplish, forming a heavy tessellated, cone-like, naked spike, from six to ten inches long. Lin. *Sp. Plant.*, 1378.

The name in Faute is *Ebru*; in Akkrah, *Abblé*; Popo, *Birrie*, or *Abirrie*; Yoruba, *Agbahdo*; Bonny, *Beakpa*; Old Calabar, *Ebochoat*; Gaboon, *M'bah*; Kongo, *Massah*.

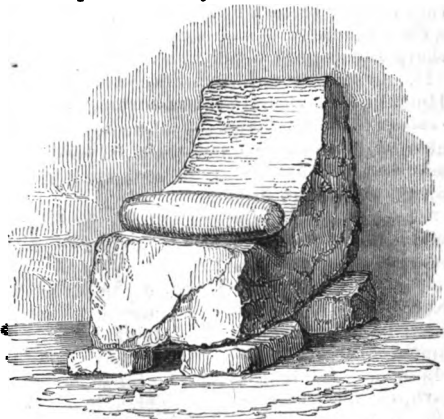
When cultivated the seeds are isolated in irregular rows, about a foot and a half apart, on some level space of land cleared with this view, and are deposited in the ground about the latter end of March or early in April, before the rainy season has set in, so that while it continues, the due amount of moisture may be provided to ensure the germination and subsequent progress of the tender

shoots. When arrived at the full maturity, the heads are cut off, and suspended to dry upon rafters within the native houses. The harvest commences about the first or second week in August; and the second harvest, from grain sown amid the rains, is concluded near the termination of October, and is extremely limited in quantity.

The mode of dressing and other economic processes devised by the people of Western Africa for the adaptation of this munificent cereal to their palates, seldom presents any conspicuous deviations, the same peculiar usages can almost be traced from the Arab to the Kaffir; the principal modifications being such as are perceptible in those countries where the culture of this plant is more decidedly encouraged, and by tribes who have somewhat emerged from the obscurity of savage life, and progressively advanced beyond the ruder arts of primitive barbarism.

In consequence of the diarrhoea and other gastro-enteritic irritations observed to occur from a protracted use in the raw state, it is rarely eaten uncooked; but the spike, after the divestment of its leafy sheath, is roasted on the embers of a slow fire, or is boiled with this covering entire; in this latter condition it may frequently be seen for sale in many of the local markets of the coast. The European residents in the colonies occasionally prepare, while yet immature, the tender grains as a substitute for the green pea, and this, when duly served with the needful accessories, is by no means a contemptible dish. The inhabitants of Ebo and Old Calabar also adapt it in a similar manner as one of the ingredients in their palm-oil soups, combined with smoked fish, prawns, and other esculent constituents. In Ashante, Popo, Dahomey, the Gold Coast, and several of the inland provinces of Yorruha, the grand alimentary preparations may be resolved into two—viz., the manufacture of a kind of bread called *kankié*, and a favourite beverage, whose reputation is pre-eminently diffused under the title of *pitto* or *peto*.

Kankiés are made after the following formula: The cone is first separated from the spike and thrown into a calabash of water, where it remains for a day. When sufficiently moistened it is taken out and ground between two stones, the inferior one being large, concave, and partly scooped out, and the upper long, convex, and tolerably cylindrical, so as to permit not only the grasp of the hand, but its adjustment into the concavity beneath. The first of these stones is placed in an oblique position, constituting an inclined plane before the worker, who is compelled to stoop when performing this labour. The



Kankie Stones.

crushing operation is repeated three or four times, or until the required quantity has been reduced into a coarse flour. The mass usually acquires a sourish taste before it is kneaded into dough, and is subsequently moulded into a number of loaves about the size of a man's fist, enwrapped in the leafy sheaths, and placed in a pot of boiling water for two hours or upwards. It is apportioned also into cakes the magnitude of the preceding, that are baked in clay or mud ovens, heated by fire, the apertures of which are closed by a cement, when the heating debris has been withdrawn. Women and girls are the only personages engaged in these domestic manipulations.

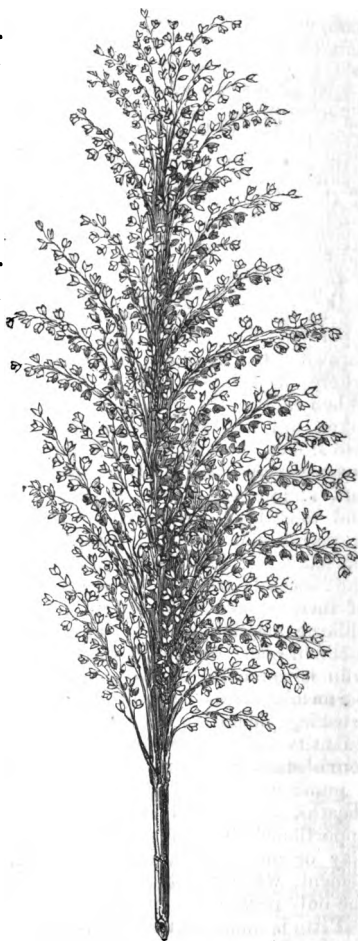
Pitto is manufactured by the succeeding method. The grain is cleared from the head, put into a proper-sized calabash, and moistened every morning by

fresh water, until the necessary approach to fermentation and sweetness has been induced. This period usually occupies from five to seven days, during which the malting is thoroughly effected by the corn being deposited in warm situations. It is next carefully dried, ground into a coarse meal, and thrown into a capacious pot of earthenware filled with water, and regularly boiled from twelve to twenty-four hours. The duration of this stage, however, varies in different localities, conformable to the customs of the people; as for example, in Popo, where the boiling is prolonged for two or three days, while in other places it is accomplished in almost as many hours. After the essential flavour and impregnation has been obtained, the fluid is strained from the dregs and poured into a number of jars, which are secluded in one of the inner compartments of the domicile, and gradually left to cool. They remain undisturbed from two to three days, or till that degree of fermentation supervenes, which best accords with their natural tastes. Occasionally a little salt is added, to facilitate the fermenting changes, and increase the potency of the intoxicating principle. In general it is of a muddy brown colour, and to Europeans has often a mawkish and somewhat insipid flatness, from the want of some bitter adjunct. When substantially brewed it becomes more agreeable and refreshing, resembling our table-beer, is highly extolled by the natives, and deemed more wholesome and nutritious than their customary potations of palm wine. The Peruvians and other American nations have also a sort of beer, made from the same grain by an analogous mode which they call *chicha de mayo* or *jora*. It is of a deep yellow tint, and is endowed with a sharp and slightly bitter taste.

II. ANDROPOGON, Linn.: *Sorghum Mich.* *Holcus Mieg.* *Brown Centrophorum, Trin.* *Guinea Corn, or Indian Millet.* — Spiculæ geminæ, terminales ternæ; una completa aristata; 1 vel 2 tabescentes steriles muticæ (raris sime in spicula tabescente glumæ aristatæ); illa biflora, flore inferiore, unipaleaceo, neutro, superiore bipaleaceo, hermaphrodito rarissime femineo. Glume 2, tardius indurato-coriaceæ muticæ. Paleæ minores, hyalinæ; inferior floris hermaphroditi longissime aristata. Stamina 3. Ovarium glabrum, styli 2 terminales. Stigmata plumosa; pilis simplicibus denticulatis. Squamulæ 2 truncatæ, plerumque, glabræ. Caryopsis glabra, paleis



Spikelet of its natural size.



Spike of the Guinea corn.

glumisque, involuta, libera. Rhachis spicata vel paniculata, sæpissimè articulata, spicæ solitariae, conjugatæ, fasciculatæ, vel paniculatæ.

2 Rhachis paniculata (Holcus Mieg. Brown). Sorghum Mich. Class Triandria. Ord. Digynia. Nat. Ord. Gramineæ.

A. Sorghum Brot. Lus., 188, Humb. et Kunth, Nov. Gen. 1, 190; Roxb. Flo. Ind. 1273. Nodis pubescentibus; vaginis foliisque glabris, margine serrulato scabris, panicula ramosa, coarctata; ramis pubescento pilosis, rhachi glabra; glumis hermaphroditis, neutrisque pubescentibus; pedicello piloso. Kth. Holcus Sorghum; Linn. Sp. Plan. 1484. Sorghum vulgare, Pers. Syn. 1, 101. Host. Gram. 4, t. 2. Willd. 4, 929. Holcus durra, Forsk. Descrip. 174. Loc. Syn.: Akkrah, Akkoko. Yoruba, Baba. Hausa, Dowah.

This cereal, indigenous to the Gold Coast and other circumjacent countries, is also to be abundantly found in that vast tract of land comprehended between the waters of the wandering Senegal and those of the distant Niger. Bountifully diffused throughout both Northern and Central Africa, and extensively raised as one of the principal articles of food for man and beast, it is varied into a manifold series of appliances by the populous communities spread over their more fertile and habitable regions. The genus embraces the well-known Durra,

(دور) of the Nubians and Egyptians, the قفولي ابيض or قفولي Ghafouly of the Desert tribes and darker races of Soudan, and the favourite Guinea corn of the West Indian negroes. Though much less common in the rivers of the Bight of Biafra and to the sea-girt lowlands that descend as far as the Kongo, even to the Portuguese territories more southward, its local distribution in these parts of the continent has hitherto escaped my recognition, though doubtless to be ascertained.* Three or four kinds are to be observed, chiefly denoted by the form and colour of their seeds, varying from a pale straw tint to brown and dark red. Within the last two centuries its native employment, owing to the naturalization of the zea, has in a great measure been restricted, and its general adoption has been driven deeper inland, where the superiority of its rival is less appreciated or tolerated.

The learned Forskal has delineated four varieties of this corn grown in Egypt, Arabia, and the adjoining coasts. They are as follow:

1. *Holcus Durra*.—Panicula ovata; spiculis sessilibus, subvillosis; alternatim appendiculatis; flosculo uno, vel duobus vacuis sessilibus.

Var. a. Glumis viridibus; seminibus albis طم شيب سیدی Taam schebb sædi.

β. Glumis fuscis; seminibus albis طم شیر ابيض Taam scheer abiad.

γ. Glumis fuscis; seminibus apice pulvis طم شیر احمر Taam scheer ahmar.

Kahiræ Durra in Arab. طم Colitur fere unicum cereale simul cum H. Dochna. Hoc est Arabum cereale vulgatissimum ex quo panis conficitur palato Europeo insipidus.

2. *Holcus Dochna*.—Panicula ramis, subternato, verticillatis, patentibus; rudimentis florum sessilibus, sub floribus fertilibus aristatis.

Semen magnitudinæ oryzae; ovale, compressum, ferrugineum in calyce persistente, apice dehiscente retentum.

Rosetta primum mihi obveniebat in horto cultus ob pabulum avicularum florens initio Novemb. Postea cereale vulgare in Arabia inveniebatur. Arab.

دخن.

Bucklandt remarks that this kind is not grown in Egypt, but chiefly in Darfour, Sennaar, and on the coast of the Red Sea, from Djedda to Mocha, where it is valued as the main support of their inhabitants. The other botanical synonymes are *Andropogon saccharatus*. Roxb. Flo. Ind., 1, 274. *Holcus*

* An undescribed variety has been ascertained to grow on the upper banks of the river Kongo.

Saccharatus, Linn., *Sp.* 1484. Wild, *Sp.*, 4, 930. *Sorghum saccharatum*, Pers. Syn., 1, 101.

3. *Holcus exiguus*.—Paniculis coarctatis ramis alterius rudimentis florum pedicellatis, sub floribus fertilibus aristatis.

Differt ab. H. Dochna altitudine vix ulnæ; differt quoque paniculis coarctatis foliis linearibus; spiculis lanceolatis rudimentis florum, non sessilibus sed pedicellatis. Ad ripam Nili initio Novemb.

4. *Holcus racemosus*.—Spica cylindrica, spiculis ternatis pedicellatis, involucris setaceis longissimis. Ubique in Yemen. Prope accedit ad H. Dochna.*

This product, like the maize, is converted to various useful purposes. By the people of Bornou and the Saharan oases, it is generally selected as the basis of that popular pudding or paste termed *ززين* Bazeen, in the absence of a

superior grain; and in the Gulf of Guinea and the Gold Coast is formed into a sort of coarse cake after its reduction into flour. The slave Kafilas, on their transit from the Bir-el-abeed to the shores of the Mediterranean, prior to the commencement of their perilous travels through the inhospitable wilds and trackless paths of the desert, are mostly subsisted on supplies of this article, purchased with the intention of sustaining the strength of those enfeebled wayfarers who have to encounter these compulsory enterprizes. In tribes who have not attained any moderate degree of civilization, the corn is simply removed from the husk, cleansed in water, and then boiled, and in this condition is eaten either with meat or cured fish conjoined with other esculent adjuncts. The ficcory of Soudan is composed of the crushed seeds, mixed with water or milk, and seasoned with bird peppers, but in a short time is apt to degenerate into that degree of acidity which renders it disagreeable to European palates.

Appropriated also, after having undergone the preliminary mutations, to the brewage of a favourite beverage, lauded far and wide under the familiar designation of *بوزة* Bouza, for its virtues and generous qualities, it has acquired a celebrity in many respects justly merited. In Akim, Dahomey, Kreepé, and other adjacent territories, it is prepared almost in a similar manner as the pitto, and though often in that excellent state as to bear an advantageous comparison with our domestic ale, nevertheless is less sought for than the former.

Clapperton remarks, that in Nufé bouza is concocted from pulverized Guinea corn, honey, peppers, and the root of a coarse grass on which the cattle are fed. These are thrown into a large earthen pot, united with a certain proportion of water, and allowed to ferment near a slow fire for four or five days, when it is transferred to other jars, and is fit for imbibition after becoming very fiery and intoxicating. In Nubia and other kingdoms of Northern Africa, although this liquor is much better made from barley, according to Burckhardt, yet the durra is not unfrequently substituted for it. "Strongly leavened bread made from durra is broken into crumbs and mixed with water, and the mixture is kept for several hours over a slow fire. Being then removed, water is poured over it, and it is left for two nights to ferment. This liquor, according to its greater or smaller degree of fermentation, takes the names of merin, bouza, or om-belbel (او بلبل), the mother of nightingales, so-called because it makes the drunkards sing. The om-belbel has a pleasant prickly taste something like champagne turned sour."†

(To be continued.)

* Flora Egyptiaco Arabica, p. 174.

† Travels in Nubia, p. 218.

ON A NEW TEST FOR UREA,

BY BARON LIEBIG.

(Extracted from a Letter to the Editor.)

For several months past I have been occupied with experiments on a new process for the determination of urea in urine, by means of the nitrate of the binoxide of mercury. Urea combines with this, and forms a snow-white, almost insoluble compound, which is immediately precipitated when urine, or a fluid containing urea, is mixed with a solution of the nitrate of the binoxide of quicksilver, containing no free acid. The precipitate contains one atom of urea, one atom of nitric acid, and four atoms of the binoxide of mercury. There is also a compound, which is beautifully crystalline, and which, for the same quantity of urea and nitric acid, contains only two atoms of the binoxide of mercury. In a liquid which contains merely urea, we can accurately determine the quantity of this principle in a few minutes to $\frac{1}{4}$ per cent. by means of a standard solution of the nitrate of the binoxide of mercury; but the presence of common salt, in urine, creates some difficulties, which yet require to be got over. Urea also combines with binoxide of mercury. I have obtained three compounds, which respectively consist of one atom of urea, with two atoms, with three atoms, and with four atoms of binoxide of mercury.

The following is a report of a

COMMUNICATION TO THE CHEMICAL SOCIETY,

BY DR. HOFMANN.

At a meeting of the Chemical Society, held at its rooms, No. 5, Cavendish Square, on Monday, the 19th of January, Dr. Hofmann favoured the Society with some remarks on Professor Liebig's new method of estimating the quantity of urea contained in urine. He stated that various methods had previously been recommended for estimating urea, among others, that of converting the urea into carbonate of ammonia, and ascertaining the quantity of nitrogen. This method, as well as some others, requires too delicate and careful manipulation, while others have been proved to furnish incorrect results. Professor Liebig had been often applied to by his physiological friends at Giessen, to devise some simple method to effect this object, such as a medical man might himself readily apply. Whilst at Giessen, during the Christmas holidays, Professor Liebig showed Dr. Hofmann the method he had recently discovered to effect this estimation of urea with great facility. It consists in treating the urine under examination with solution of the nitrate of the binoxide of mercury. Dr. Hofmann then took a solution containing a known quantity of urea, and to it added a portion of a measured quantity of a standard solution of the nitrate. A copious white precipitate, resembling chloride of silver, was immediately formed, with liberation of free nitric acid. As the presence of this acid prevents the further action of the nitrate, Dr. Hofmann next added to the solution a sufficient quantity of baryta water to neutralise the acid. This done, the addition of a fresh portion of the nitrate produced a further precipitate; and so on, by repeated additions of the test, and subsequent neutralisation of the free acid by baryta water, Dr. Hofmann precipitated the whole of the urea present in the solution. Immediately the whole of the urea was precipitated, the addition of a further quantity of the nitrate solution produced a yellow precipitate of binoxide of mercury. The quantity of urea present in a given sample of urine, may thus be readily deduced from the quantity of a solution of the nitrate of mercury required for its precipitation.

Dr. Hofmann then took a sample of urine, and with it repeated the experiment he had just before performed on a solution of urea.

It was suggested, that the presence of ammonia in urine would interfere with the practical value of the test, and lead to incorrect results. This, however, would not be the case with fresh urine, which would usually form the subject of the medical man's examination.

In reply to the question, whether the presence of diabetic sugar in urine would interfere with the successful action of the proposed test, Dr. Hofmann stated, that he

did not know whether it had been tried or not, but it was his opinion that it would not affect the result obtained.

Dr. Hofmann stated it to be the intention of Professor Liebig to communicate a full account of his present researches on the subject to the Chemical Society. In the meanwhile, he requested Dr. Hofmann to be the exponent of his views, for the purpose of eliciting the opinions of others with respect to the successful application of the process.

A SHORT NOTICE OF THE PHARMACOPŒA FENNICA, AND PHARMACY IN FINLAND.

BY DR. N. P. HAMBERG,

Assistant Professor of Pharmacy to the Royal Caroline Institution, and to the Pharmaceutical Institution of Stockholm.

As long as Finland was joined with Sweden it had the Swedish Pharmacopœia; but as soon as it came under the Russian Empire, the Autocratic Government being anxious to extinguish every trace and remembrance of Sweden, commanded the publication of a Finnish Pharmacopœia, and some time afterwards (1819) the first edition appeared. This work, however, was nothing more than the old Swedish Pharmacopœia with a new title, and a very few alterations of the names of some of the medicines, and of the methods for preparing them.

The first edition, like the original one, was divided into two sections: "1. *Materia Pharmaceutica*," containing drugs and other medicines of commerce; and "2. *Præparata Pharmaceutica*," containing rules and methods for preparing those medicines which must be manufactured by the Apothecary or Dispensing Chemist himself. In each section the medicines were arranged in alphabetical order, but so that parts of a plant were to be found under the pharmaceutical name of the plant itself; for example, *radix* as well as *folia*, from *Atropa Belladonna*, both under the head "*Belladonna*;" *flores*, *folia*, *cortex*, *fructus*, and *fructus immaturus* of *Citrus Aurantium*, DC., under the head "*Aurantium*."

The second edition, which like the first, is written in Latin, contains many new medicines and improved methods for preparing the old ones. But not being divided, like the first, into the above-mentioned sections, the drugs and preparations are all promiscuously thrown together; though of course arranged in alphabetic order. The arrangement, however, is even in that respect different; thus the same parts of different plants are brought together, viz., *flores arnicæ*, *fl. chamomillæ*, *fl. lavandulæ*, &c.; *radix althææ*, *rad. angelicæ*, *rad. arnicæ*, &c. I prefer the old arrangement, as being more convenient and instructive, and enabling us to perceive what parts of a plant are used as medicines. In the new arrangement there is also some difficulty in finding the place of some medicines, viz.: *flores rosarum*, which must be looked for at the letter P., because it has obtained the now more scientific name of "*Petala rosarum*." On the contrary, the old pharmaceutical name "*Poma aurantii*" is maintained for the unripe fruits of *Citrus Aurantium*, var. *amara*, Linnæus.

The Supplement is written in Swedish, which language is still commonly used in speaking and writing in the towns, and a great deal of the country, in Finland. It contains the properties and the tests for the medicines, and could, if somewhat shortened, have been included in the Pharmacopœia. Several medicines would then not have appeared there so naked as is now the case, viz.: *Acetum vini*, *acidum citricum*, *argentum*, *bicarbonas kalicus*, *bicarbonas natrius*, *bolus armena*, *cuprum*, *iodum*, and several others, about which the Pharmacopœia tells nothing more than their names, but the description of which is to be found in the Supplement.

The Pharmacopœia has the title, "*Pharmacopœa Fennica*. Editio secunda, Helsingforsæ, 1850." The types of this work are very fine, and the style is plain and distinct, and written in good Latin. The introduction contains sixteen pages: it commences with a charter from the Imperial Senate, "*Senatus Cæsareus*," which honourably mentions as authors Professor Adolf Moberg,

the Dispensing Chemist, "Pharmacopola;" Frans Michael Mexmontan; and "Officinæ Medicamentariæ Administrator," Carl Johan Wikberg. The charter finishes with an order that this Pharmacopœia is to be valid from the beginning of the year 1852.

Page v. commences "Præmonenda," of which the first section, "De Medicamentis," contains general regulations for collecting the native medicines, and especially for radices, cortices et ligna, herbæ et folia, flores et summitates florentes, semina, lichenea. Besides there are subsequent regulations:—Narcotica must be collected from wild plants. The Dispensing Chemist must, as far as possible, prepare the medicines himself, or, if they are bought, he must be answerable for their purity.

If a medicine occurs both in a crude and in a depurated state, and the prescription does not determine which of them is to be employed, the depurated must always be dispensed.

Likewise if a medicine is to be met with both in the diluted and in the concentrated form, but the prescription does not specify which, the diluted must always be dispensed.

In dispensing extracta pulverata it must be observed that they contain (through admixture of milk sugar) precisely a third part of extractum humidum of the same plant.

Poisons must be kept in a separate and closed place.

The Chemist is not allowed to dispense poisons and other so called "medicamenta heroica," without a sufficient prescription, which must, if the dose be stronger than usual, have the expression "dosis magna," without which the Chemist is not allowed to dispense it.

To internal medicines must be attached white labels, and to external remedies coloured ones.

Poisons and medicamenta heroica are to be sealed with black sealing wax.

The second section of the Præmonenda, "De Instrumentis," states that the celsian, or centigrade thermometer, must be used, and that the specific gravity of fluids must be taken at $+15^{\circ}$. Moreover, that in every shop must be two areometers; one for fluids heavier than water, and another for lighter ones. Likewise a balance so sensitive as to indicate accurately $\frac{1}{4}$ of a grain, and belonging to that balance the following "pondera platinea accuratissima" of 10, 5, 2, 1 grain, and $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$ of a grain.

If not otherwise prescribed the quantities must always be determinated by weight.

Pages viii., ix., "De Mensuris et Ponderibus," inform us that the pes Fennicus is the same as the Swedish foot, and $= \frac{1}{4}$ ulna ($\frac{1}{4}$ yard) $= 10$ Pollic. decim. $= 100$ lin. decim. $= 0,29690$ metr. Gallis $= 131,61$ lin. Paris; and a Parisian meter consequently is equal to 3,36815 Finnish feet.

A congius s. cantharus (Kanna) $= 100$ Pollic. decim. cubicis $= 2$ semicongii (Stop.) $= 8$ quartarii (quarter) $= 32$ modiolii (Jungfrur).

Libra medicinalis Fennica (Liber) $= 357,66391$ French grammes, is divided in the same manner as in other countries, into ounces, grachms, and grains.

Libra civilis (Skålpund $= 425,0369$ French grammes, is like the Swedish, and divided into 32 semunciæ (Lod.), every one of which contains 4 drachmæ (quintin).

Page x. contains "Index Venenorum," or a list of those medicines which must be kept separate and locked up; it consists of the following medicines:—Acetas morphicus, acetas strychnicus, acidum arsenicosum, chloretum hydrargyricum corrosivum, iodetum hydrargyricum rubrum, liquor arsenitis kalici, morphium, oleum amygdalarum amararum æthereum, opium, oxidum hydrargyricum, phosphorus, strychnium, veratrium.

The following might with equal propriety be included in the list, viz.:—acetas plumbicus, chloretum hydrargyrosom mite, cyanetum ferroso zincicokalicum, extractum opii, iodetum hydrargyrosom, liquor nitratis hydrargyrosi, &c.

Pages xi. and xii. contain a "Tabula," which shows the quantity of medicines allowed to be dispensed, *pro dosi*, for internal use. A greater quantity is, as before-mentioned, not allowed to be dispensed without this expression of the

physician, "Dosis magna." This tabula seems to be in some parts too precautions; thus, for example, it is not allowed to dispense more than a grain *pro dosi* of extractum aconiti, extract. hyoscyami, and kermes minerale, &c.; on the contrary, some other very powerful medicines can be dispensed without restriction, viz.: extractum colocynthis, ext. conii, folia digitalis, oxidum zincicum, pulv. ipecacuanhæ, resina jalapæ, &c.

Pages xiii.—xvi. contain a memorandum which determines the quantities of powerful medicines contained in some compounds; with this the introduction ends, and we now pass over to the Pharmacopœia itself, which contains, together with the register and five tables for the comparison of weights and measures in different countries, 175 pages. I have mentioned that several new medicines have been introduced into this edition, and will now enumerate some of them, viz.: acidum gallotannicum (this name is better than acid quercitanicum in Pharm Svecic.), amygdalinum, chloroformium, cyanetum ferroso-zincico kalicum, decoctum Zittmanni fortius et mitius, emulsio hydrocyanica, hydras magnesi in aqua (of which seven libras always must be kept ready in every shop), iodetum ferrosus saccharatum, iodetum hydrargyricum rubrum, iodetum hydrargyrosus, iod. kalicum, iodetum plumbium, iodetum sulphuris, iodium, liquor sulphatis ferri, of which the Pharmacopœia states, "Duæ libræ hujus liquoris semper in officina prostabunt," (this liquor is used for making mixtura hydratis ferri et magnesi, s. mixtura antidotica), morphium and acetas morphicus, oleum amygdalarum amararum æthereum, quercitanas plumbicus, sulphuretum calcicum, sulphuretum stibicum del factitium, syrupus iodeti ferrosi, strychnium and acetas strychnicus, valerianas zincicus, &c.

Among the improved methods for preparing medicines, the following deserve to be mentioned as very good:

Extracta Pulverata, the preparation of which is described at page 50, under the head extractum aconiti pulveratum, and is effected by the admixture of two ounces of sugar of milk with one ounce of extractum humidum, drying the mixture, powdering, and adding as much powdered sugar of milk as is necessary to give the powdered extract the weight of three ounces. Consequently it must possess the strength of the third part of its weight of the extractum humidum. The advantage of this method is, that the desiccation can be performed much more rapidly, and by that the extract will not be decomposed by exposure to the air.

Chloretum zincicum is prepared from oxidum zincicum. By this means a pure preparation is obtained, which is not the case when the metal is dissolved in hydrochloric acid.

The method adopted for preparing sulphate of iron by precipitating the solution by means of alcohol is the best,* and we believe that every Dispensing Chemist in Finland is indebted to the authors for introducing a method of preparing it, which yields an article that keeps for a long time, instead of employing the old method, which yields a preparation liable to partial decomposition in a few days.

Good directions are generally given for the preservation of medicines, but in reference to the distilled waters which are ordered to be kept in "vasis leviter oclausis," I think the word "bene" should be substituted for "leviter."

With regard to the names of the medicines I will only make a few observations. I consider that to the name "acidum aceticum," there should be added, in order to prevent mistakes, "concentratum," as we find that if a physician using the name adopted send to a Chemist the following prescription:

R Acidi Acetici, ʒij.

the Chemist would, according to the above-mentioned regulations, be obliged to dispense acidum aceticum dilutum, which the physician did not intend. Infusum Chinæ frigide et calide præparatum would be better than inf. Chinæ calidum et frigidum.

(To be continued.)

* I have in my possession a bottle of this salt, prepared 1839, according to the adopted method, and I could not observe any change of the article in 1851, notwithstanding the bottle has been opened many times every year.

OF LINIMENTUM ÆRUGINIS.

BY MR. JOHN HARLEY.

THE following are some observations on the "*Linimentum Æruginis*," which I have sent for insertion in your Journal, if you think them worthy.

Having lately to make the above preparation, I proceeded, according to the directions of the *Pharmacopœia*, by boiling the solution of acetate of copper with the honey, when in a few minutes I was surprised at the appearance of a large quantity of a bright-red deposit, while the solution itself appeared quite colourless. This led me to investigate it more fully, which I did with the following results:—

I first of all repeated the above process, by taking one part of the usual powdered verdigris, and dissolving in seven parts of strong, brown vinegar, by the aid of a gentle heat, and filtering from a little residue (which appeared to be oxide of copper, together with other impurities) then adding to the deep-blue solution fourteen parts of semi-solid granular honey. This mixture, when heated to boiling, in a beaker glass, immediately began to decompose, and in three or four minutes longer the decomposition was complete; the solution of acetate of copper being reduced by the grape-sugar, and the copper precipitated as red or sub-oxide, while the filtered solution was nearly colourless, and scarcely at all affected by sulphuretted hydrogen, or ferrocyanide of potassium; it is, in fact, little better than simple oxymel, which appears to be the "*Linimentum Æruginis*" of the *Pharmacopœias*! A formidable preparation, truly, by name, but, in reality, a perfectly inert one—out of five samples, obtained from different sources, not one contained more than the slightest trace of copper.

The above experiment was varied by employing acetic acid, and pure acetate of copper, and also several samples of verdigris, honey, &c., and in different proportions, but with exactly the same results.

Now, it appears, that in order to obtain an active preparation, we must merely avoid a temperature approaching to boiling, by which we obtain a fine green solution, possessing all the properties of a solution of a salt of copper.

I find that the fluid uncrystallizable portion of the honey is to be preferred, inasmuch as it requires a much longer continued heat to effect the complete decomposition of the copper solution than when the solid honey is used.

If the Colleges intended the acetate of copper to be decomposed, and nearly the whole of the copper precipitated, the name of the preparation (*Linimentum Æruginis*) is incorrect, as it contains no acetate of copper. So far as I know, the sediment (which, in a short time, becomes too hard to stir up) is always avoided, the supernatant liquid being used. If this precipitate forms an important ingredient in the compound, the fact should be generally known by Chemists. The preparation is a popular remedy in this neighbourhood, for sore mouth, and I have frequently seen it prescribed by medical men, for ulcerated throat and tongue, in which cases the decomposed preparation appears to me to be unsuitable.

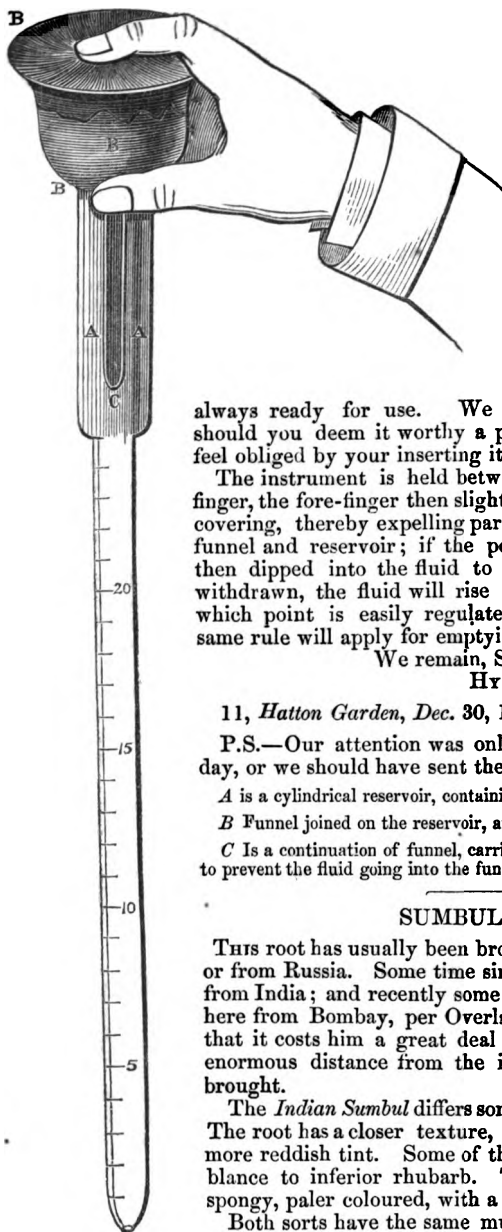
Ludlow, January, 1852.

[While we admit that the name *Linimentum Æruginis* does not correctly describe the preparation, we cannot agree with our correspondent in his inference, that the process ordered in the *Pharmacopœia* implies inadvertence or ignorance of the nature of the decomposition which takes place. The precipitate has been described in works on Pharmacy, and an article on the subject, by the late Mr. Queckett, will be found in the fourth volume of this Journal, page 363.

The process suggested by our correspondent may possibly be an improvement, but the resulting preparation being quite different from that ordered in the *Pharmacopœia*, the Chemist would not be justified in substituting the one for the other.—Ed.]

MINIM METER.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.



SIR, — Several suggestions have latterly appeared in your Journal for a new minim measure, and, although all very clever, yet none of them seem to be so well adapted to the purpose intended as an old instrument that we have made years ago, and still make to the present time; whose invention it is we do not know, but the instrument is exceedingly simple, inexpensive, and not liable to disarrangement, and may be laid down anywhere and in any position, being

always ready for use. We enclose you a sketch, and should you deem it worthy a place in your pages, we shall feel obliged by your inserting it.

The instrument is held between the thumb and middle finger, the fore-finger then slightly presses on the caoutchouc covering, thereby expelling part of the air contained in the funnel and reservoir; if the point of the divided tube is then dipped into the fluid to be used, and the pressure withdrawn, the fluid will rise to any indication required, which point is easily regulated by the fore-finger. The same rule will apply for emptying the instrument.

We remain, Sir, yours obediently,
HY. NEGRETTI AND ZAMBRA.

11, Hatton Garden, Dec. 30, 1851.

P.S.—Our attention was only called to the matter this day, or we should have sent the sketch earlier.

A is a cylindrical reservoir, containing fluid to be measured.

B Funnel joined on the reservoir, and tied over with caoutchouc.

C Is a continuation of funnel, carried down in the centre of reservoir to prevent the fluid going into the funnel.

SUMBUL ROOT.

THIS root has usually been brought to England, *via* Russia, or from Russia. Some time since a box of the root arrived from India; and recently some tins of it have been received here from Bombay, per Overland Mail. The owner states that it costs him a great deal of money on account of the enormous distance from the interior which it had to be brought.

The *Indian Sumbul* differs somewhat from the Russian sort. The root has a closer texture, is firmer, denser, and has a more reddish tint. Some of the pieces have a slight resemblance to inferior rhubarb. The *Russian Sumbul* is more spongy, paler coloured, with a yellowish green tint.

Both sorts have the same musky smell; but the Russian sort is perhaps more powerfully odorous.

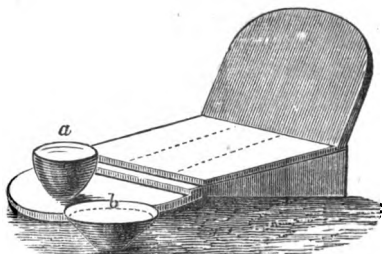
SELECTIONS FROM THE RECORDS OF THE BENGAL GOVERNMENT,
ON THE SYSTEM OF CULTIVATING THE POPPY AND OF PREPARING
OPIUM IN THE BENARES OPIUM AGENCY ;

With a Brief Sketch of the Constitution of the Department.

BY W. C. B. EATWELL, M.D.

(Continued from page 311.)

Down either side of the room in which the vats are placed, are ranged the cake-makers, numbering usually about one hundred and ten individuals. Each man being seated upon a wooden stand, and being furnished with a brass cup, forming the half of a hollow sphere, and with another tin vessel graduated so as to hold a determinate quantity of fluid. On the previous evening the leaves requisite for forming the shells of the cakes have been weighed out and tied up in bundles of prescribed weight, and have been damped to render them supple. Down the centre



Wooden Stand.—a. brass cup—b. tin vessel.

of the room are placed a certain number of small scales, at which the quantity of opium intended for each cake is separately weighed, and beside the scales are boxes filled with lewah, for the agglutination of the leaves which form the shells of the cakes. In forming the lewah, all opium of inferior quality is used, and all the pussewah received is also employed for this purpose, but in addition to these, a considerable quantity of unexceptionable drug is also expended. These are broken down in the washings of the various pots and vessels which have contained opium, and a thin semi-fluid paste is formed of such a consistence that 100 grains of it when evaporated to dryness, at a temperature of 200 Fah. shall leave 53 grains of residue.

Matters being thus arranged, the cake-maker receives in his graduated measure from the lewah box, the prescribed quantity of lewah for making a single cake, and having by his side a bundle of leaves previously weighed, he rapidly forms in his brass cup the lower segment of the shell of the opium cake, pasting leaf over leaf, until the thickness of half an inch has been obtained, and allowing a certain free portion of the most external leaves to hang down all round over the sides of the brass cup. This accomplished, a boy is in waiting with the opium to be put into the cake, which he has just brought from the caking scales, and which he throws into the shell so far prepared to receive it. The cake-maker holding the opium away from the sides of the shell with the left hand, then tucks in round the sides leaf after leaf, well smeared with lewah, imbricating one over the other, until he has completed the entire circle; the free edges of the leaves, which had hitherto hung over the sides of the cup, are now drawn up tightly, and the opium well compressed within its bag of leaves.

A small portion at the top now only remains, which is speedily closed by laying on leaf after leaf, and finally the work is completed, by the application of a single large leaf, which covers the entire exposed half of the cake. As thus formed, the well-finished cake is a pretty regular sphere, not unlike, in size and appearance, a 24 lb. shot. It is now rolled in a little finely-pounded poppy trash, which adheres to its surface, is at once placed in a small earthen cup, of precisely the same dimensions as the brass mould in which it was made, and is carried out into the open air, and exposed to the direct influence of the sun. It is so exposed for three days, during which time it is frequently turned, and examined, and if (as is frequently the case) it should have become distended and puffy, it is at once torn open, the extricated gas allowed to escape, and the cake again tightly closed. On the evening of the third day it is placed (still contained in its cup) in the cake frames, which are formed of open battens, and allow of a free circulation of air about the cakes. The average number of cakes made by a single man, in one day, is about 70; but there are cake-makers who will turn out as many as 90 or 100 cakes, between 9 A.M. and

3 P.M. The number of cakes made daily in the factory, during the manufacturing season is, from 6500 to 7000, and the total number of cakes manufactured, during the present season, has been 426,800.

By the end of July the manufacturing is finished, but the cakes still require much attention—they are constantly turned over in their cups, and as mildew collects on their surfaces, it is removed by rolling and rubbing them in dry poppy trash. They are, moreover, individually examined, and those which present weak points are strengthened by the application of extra leaves, and their appearance is moreover improved by the application of a single leaf of the first quality, which being of large dimensions, and carefully and equally made, covers the greater portion of the surface of the cake, and gives to it a smooth and finished appearance.

The regulated weights of the component parts of each cake are as follow:—

	Seers. Chks.	
Standard opium of consistence $\frac{10}{100}$	1	10
Standard opium converted into lewah.....	0	4
Leaves.....	0	$5\frac{1}{2}$
Total	2	$3\frac{1}{2}$

By October the cakes have become perfectly dry to the touch, and have acquired considerable solidity, and they are now packed in chests, each of which is furnished with a double tier of wooden partitions, each tier presenting twenty square compartments, for the reception of so many cakes, and in which the cakes are steadied by means of loose poppy trash, with which all the interstices are filled.

It might be supposed that so fragile a structure as the poppy petal would furnish but an insecure packing envelope, but the shells of the opium cakes are possessed of more resistance than might be imagined, and owing apparently to some antiseptic property in the lewah, they are capable (after once being thoroughly dried) of being preserved for a great length of time. For three or four months after manufacture the shells require constant care and attention; and even after being packed, any exposure to damp or moisture, subjects them to injury. After a certain lapse of time, however, the opium contained in the cake ceases to yield any more moisture to the shell, and this latter acquires extreme solidity. There are three specimen cakes in the Ghazee-pore factory which are some fifteen years old; they are as solid as balls of wood, and may be thrown from a height upon a stone floor without injury.

The above process of manufacture applies to the opium which is put up for the China market, and which includes the great bulk of the entire provision. With the drug intended for internal consumption, and called abkaree opium, a different process is followed. The opium intended for abkaree purposes is brought to a consistence of 90 per cent. by direct exposure to the sun, in which state it is as firm, and as easily moulded as wax. It is then formed by means of a mould into square bricks of one seer weight each, and these are wrapped in oiled Nepaul paper, and packed in boxes, furnished with compartments for their reception. The opium put up in this way, has not the same powerful aroma as is possessed by that put up in balls; but this is its only deficiency, whilst it has the great advantage of containing a large amount of drug, in a very limited space, and in a state very manageable for packing.

The manufacture for the season being finally concluded, six cakes are selected promiscuously from the provision by the magistrate of Ghazee-pore for examination and chemical analysis. Of these, two are forwarded to the opium examiner at Calcutta, two to the examiner of the Behar agency, and two are reserved for examination by the examiner of the Benares agency.

The examination which these cakes undergo has reference to the following points:

1. The gross weight of the cake.
2. The weight of the shell, detached as clearly as possible from the contained opium.
3. The weight of the opium contained in the shell.
4. The condition of the shell.
5. The physical character of the drug.
6. Its consistence.
7. The amount of extract taken up from it by cold distilled water.
8. The quantity of morphia present.
9. The quantity of narcotine present.

The following table will show the chemical results of the examination of the opium of the Benares agency during the past four years.

Season.	Residue from 100 grains exposed to a temp. 200° F.	Extract taken up by cold distilled water from 100 grs.	Morphia per cent.	Narcotine per cent.
1845-46.	73	52.33	2.76	5.33
	75	50.26	2.20	5.20
Average	74	51.29	2.48	5.26
1846-47.	72	43.25	2.46	4.30
	72	42.25	2.30	4.75
Average	72	42.75	2.38	4.52
1847-48.	71	44.43	2.23	5.66
	70	39.26	2.17	5.70
Average	70.5	41.84	2.20	5.68
1848-49.	75.5	47.37	2.75	3.85
	75.5	48.62	3.67	4.27
Average	75.5	47.99	3.21	4.06

A chief chemical feature which distinguishes Bengal opium from that of Turkey and Egypt, is the large proportion which the narcotine in the former bears to the morphia, and this proportion is shown by the above analysis to be constant in all seasons. It is a matter of importance to ascertain, whether the treatment which the juice receives after its collection, can influence in any way the amount of the alkaloids, or of the other principles contained in opium. In Turkey, it is the custom to beat up the juice with saliva; in Malwa it is immersed as collected, in linseed oil, whilst in Bengal it is brought to the required consistence by mere exposure to the air in the shade, though at the same time all the watery part of the juice that will separate is drained off, and used, as has already been explained, in making lewah.

The following are the results which I obtained from the analysis of fresh juice, collected in February, 1850, and from which none of the pussewah was separated. The analyses have specially reference to the amount of the alkaloids, morphia and narcotine present in the drug, no attempts having been made to separate any of the other principles in a state of purity.

I.

Analysis of 2000 grains of freshly collected juice, subjected to experiment in the day of collection.

	Grains.
Morphia	11.1
Narcotine	32.7
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, &c., &c.	521.0
Dry marc insoluble in alcohol, lignin, caoutchouc, &c., &c.	225.2
Water and volatile matter separable at a heat of 200° Fah.	1210.0

Total 2000.0

In the following experiment the juice, instead of being subjected at once in its crude state to experiment, was exposed in an evaporating basin, to a temperature of 200 Fah. until it was judged to have reached about the factory standard consistence, and of the opium so prepared, 1000 grains were subjected to analysis.

II.

	Grains.
Morphia	24.9
Narcotine	30.9
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, &c., &c.	546.7
Dry marc insoluble in alcohol, lignin, caoutchouc, &c., &c.	215.0
Water and volatile matter, separable at 200° Fah.	182.5

Total 1000.0

In experiment III., a portion of freshly collected juice was placed in an open porcelain basin, on the 23rd February, and occasionally stirred with a glass rod, until it had acquired solidity, no attempt being made to separate any pussewah from it. On the 7th May it was found to have acquired a consistence of 90.3 per cent., and its analysis gave the following results :—

	Grains.
Morphia	26.1
Narcotine	32.8
Other matters soluble in alcohol, codeia, narceia, meconic acid, resin, &c., &c.	630.4
Dry marc insoluble in alcohol, lignin, caoutchouc, &c., &c.	213.7
Water and volatile matter, separable at a heat of 200° Fah.	97.0

Total 1000.0

In order to be able to compare these results, one with another, we will suppose, in each case, the drug to have been reduced to a similar state of dryness, by exposure to a heat of 200° Fah., when the composition of the three different specimens will appear as follows :—

	1.	2.	3.
Morphia	1.405	3.061	2.890
Narcotine	4.012	3.795	3.632
Matters soluble in alcohol	65.949	66.874	69.811
Dry marc insoluble in alcohol	28.506	26.301	23.665
Total	99.872	100.031	99.998

The agreement of the results in these three sets of experiments is tolerably close, except in the case of the drug subjected to analysis on the day of collection, in which the quantity of morphia present is extremely small; but, as if to compensate for the deficiency, to a certain amount, the quantity of narcotine present is larger than in either of the other two specimens. The suggestion which this arrangement naturally prompts is, whether it be possible that narcotine, by parting with its portion of its carbon, hydrogen, and oxygen, during the process of analysis, or during the changes which occur in juice after its extraction from the plant, can be converted into morphia. The proposition is, however, quite speculative, and could only be satisfactorily demonstrated by a careful set of minute experiments, having reference to the proportions of all the principles entering into the composition of opium, at different periods, from the date of the extraction of the juice, until the cessation of all fermentive action, which takes place until the drug has reached a certain degree of spissitude. The results of the second analysis are worthy of remark; they seem to indicate, that the employment of artificial heat in bringing the drug rapidly to the required consistence, is not detrimental to the narcotic excellence of the resulting opium; on the contrary, the experiment, as far as it goes, appears to indicate the very opposite. It has already been stated in the body of this paper, that in preparing the drug, the cultivators drain from it all the fluid portion, and which of course consists of the most soluble of the principles of opium, dissolved in dew, or in moisture absorbed from the atmosphere. I now propose alluding more particularly to this fluid, to which the name of pussewah is given, and which is brought to the factory in large quantities, of many gallons at a time, and of all consistences, from that of a limpid fluid to that of thick treacle.

Recently collected pussewah is a dark fluid, resembling strong infusion of coffee, and having a peculiar smell. It reddens strongly litmus paper; a solution of diacetate of lead causes in it a most copious grey precipitate (meconate of lead) and lime water has the same effect. Ammonia throws down a copious precipitate, of a mottled grey colour, which soon becomes uniformly black, and copious dilution with water

likewise occasions in it a deep brown precipitate. I found the specific gravity of some recently collected pussewah to be 1.120, the temperature of the atmosphere being 83°, and 100 grains, on evaporation to dryness, were found to yield 30 grains of a brownish yellow residue, emitting an odour somewhat resembling that of heated Burgundy pitch. After pussewah has become concentrated to about one-third of its original volume, it acquires the consistence of treacle; and, as the process of drying goes on still further, it gradually becomes solid. During the hot and dry months this solid residue acquires resinous hardness, becoming brittle, and breaking with a resinous fracture, but as soon as the weather becomes damp, it rapidly absorbs moisture from the atmosphere, becomes jetty black, and polished on the surface, and acquires a consistence similar to that of cobbler's wax. Pussewah (as might be supposed) contains some of the most valuable constituents of opium; its principal components are meconic acid, resin, morphia, and narcotine. From 500 grains of solid pussewah, which, on evaporation to dryness, left 88.9 grains of residue, I extracted 12 grains of pure narcotine, but only a trace of morphia. I, however, am inclined to attribute this latter result to an accident in the analysis; as in a second analysis of 500 grains of solid pussewah, which, on evaporation yielded 85.5 grains of residue, I obtained 10.6 grains of morphia, and 16.9 grains of narcotine. In order to form an idea of the precise extent to which the composition of Bengal opium is affected by the practice of draining from it the pussewah, it is requisite to ascertain, with some approach to accuracy, the quantity of pussewah usually furnished by a given amount of opium. The quantity of standard opium received at the sudder factory of the Benares agency, during the season of 1849-50, was 18,191 maunds, whilst the quantity of pussewah delivered amounted to 100 maunds, being at the rate of one maund of pussewah to nearly 182 maunds of drug, the pussewah containing on an average, say 50 per cent. of solid matter. This pussewah, be it observed, although separated from the drug, is not lost to the provision, being employed in the formation of the shells of the cakes; and, as the Chinese form a watery extract of the drug for the purpose of smoking, the whole of the constituents of the pussewah are thus recovered on boiling the shells in water, as is practised in China.

Amongst the thousands of individuals, cultivators and employés with whom the factory is filled during the receiving and manufacturing seasons, no complaints are ever heard of any injurious effects resulting from the influence of the drug, whilst they all remain quite as free from general sickness as persons unconnected with the general establishment, in fact, if anything more so. It occasionally happens that a casual visitor to the factory complains of giddiness or headache, but the European officers employed in the department, who pass the greater part of the day with the thermometer between 95° and 105° Fah. amongst tons of the drug, never experience any bad effects from it. The native purkhea sits usually from six A.M. to three P.M. daily, with his hand and arm immersed nearly the whole time in the drug, which he is constantly smelling, and yet he feels no inconvenience from it. He has informed me that at the commencement of the season he experiences usually a sensation of numbness in the fingers, but I believe this to be more the result of fatigue, consequent upon the incessant use of the arm and fingers, than of any effect of the opium. In the large caking vats, men are employed to wade knee-deep through the drug for several hours during the morning, and they remain standing in it during the greater part of the rest of the day, serving out the opium by *armsful*, their bodies being naked, with the exception of a cloth about the loins.

These men complain of a sensation of drowsiness towards the end of their daily labours, and declare that they are overpowered early in the evening by sleep, but they do not complain of the effect as being either unpleasant or injurious.

Infants, of a few months old, may be frequently seen lying on the opium-be-smear'd floor under the vats, in which dangerous position they are left by their thoughtless mothers; but, strange to say, without any accident ever occurring. Here are abundant facts to show, that the health of those employed in the opium factory, and in the manipulation of the drug, is not exposed to any risk whatever, whilst the impunity with which the drug is handled, by hundreds of individuals, for hours together, proves that it has no endermic action, for I am inclined to consider the soporific effect experienced by the vat-traders as produced through the lungs, and not through the skin.

CONCLUSION.—The object sought in this paper, has been to give an outline of the constitution of the opium department in Bengal, to indicate the machinery by which it is worked, and the rules by which the conduct of its officers is governed, as well

as to present a sketch of the mode of cultivation of the poppy plant, and of the preparation of opium.

Any thing beyond this would be foreign to the purpose; however, in concluding, I would offer a few observations on the subject of the influence which the practice of opium-smoking in China is supposed to exert upon the moral and physical constitution of the inhabitants of that country. The question, be it observed, can never be settled in a manner to satisfy impartial and philosophic enquirers, until the demonstrative evidence of statistics shall be brought to bear upon the subject; and, until that shall be the case, we must rest satisfied with the evidence of unprejudiced observers.

It has been too much the practice with narrators who have treated on the subject, to content themselves with drawing the sad picture of the confirmed opium debauchee, plunged in the last state of moral and physical exhaustion, and having formed the premises of their argument of this exception, to proceed at once to involve the whole practice in one sweeping condemnation. But this is not the way in which the subject can be treated; as rational would it be to paint the horrors of delirium tremens, and upon that evidence, to condemn at once the entire use of alcoholic liquors. The question for determination is not what are the effects of opium used to excess, but what are its effects on the moral and physical constitution of the mass of the individuals who use it habitually, and in *moderation*, either as a stimulant, to sustain the frame under fatigue, or as a restorative and sedative after labour, bodily or mental. Having passed three years in China, I may be allowed to state the results of my observation, and I can affirm thus far, that the effects of the abuse of the drug do not come very frequently under observation, and that when cases do occur the habit is frequently found to have been induced by the presence of some painful chronic disease, to escape from the sufferings of which the patient has fled to this resource. That this is not always the cause, however, I am perfectly ready to admit, and there are, doubtless, many who indulge in the habit to a pernicious extent, led by the same morbid impulses which induce men to become drunkards in even the most civilized countries, but these cases do not at all events come before the public eye. It requires no laborious search in civilized England to discover evidences of the pernicious effects of the abuse of alcoholic liquors; our open and thronged gin-palaces, and our streets afford abundant testimony on the subject; but in China this open evidence of the evil effects of opium is at least wanting. As regards the effects of the habitual use of the drug on the *mass* of the people, I must affirm, that no injurious results are visible. The people generally are a muscular and well-formed race, the labouring portion being capable of great and prolonged exertion under a fierce sun, in an unhealthy climate. Their disposition is cheerful and peaceable, and quarrels and brawls are rarely heard amongst even the lower orders; whilst in general intelligence they rank deservedly high amongst orientals.

I will therefore conclude with observing that the proofs are still wanting to show that the moderate use of opium produces more pernicious effects upon the constitution, than does the moderate use of spirituous liquors, whilst at the same time, it is certain, that the consequences of the abuse of the former, are less appalling in their effect upon the victim, and less disastrous to society at large, than are the consequences of the abuse of the latter. Compare the furious madman, the subject of delirium tremens, with the prostrate debauchee, the victim of opium; the violent drunkard with the dreaming sensualist intoxicated with opium; the latter is at least harmless to all except to his wretched self, whilst the former is but too frequently a dangerous nuisance and an open bad example to the community at large.

(Signed) W. C. B. EATWELL, M.D.,

First Assistant and Opium Examiner

Board of Customs, Salt and Opium, the 1st November, 1850.

(True copy)

A. C. BIDWELL, *Officiating Secretary.*

PREPARATION OF TEA.

BY BERTHOLD SEEMANN.

In the *Manual of Scientific Inquiry* you ask whether, in the northern provinces of China, Indigo or any other vegetable dye is used in colouring green tea? Whether different processes of dyeing are pursued in the north from those of the south I cannot say, but it is certain that around Canton, whence great quantities are

annually exported, the green tea is dyed with Prussian blue, turmeric, and gypsum, all reduced into fine powder. The process is well described by Sir John F. Davis (*The Chinese*, vol. iii. p. 244, *et seq.*), who, however, falls into the strange mistake of supposing the whole proceeding of colouring to be an adulteration, and leaves his readers to infer that it is only occasionally done in order to meet the urgency of the demand, while it is now very well known that all the green tea of Canton has assumed that colour by artificial dyeing. I had heard so much about tea—copper-plates, picking of the leaves, rolling them up with the fingers, boiling them in hot water, &c. &c.,—that I became anxious to see with my own eyes the process of manufacture, of which the various books had given me such a confused idea. One of the great merchants conducted me not only to his own but also to another establishment, where the preparation of the different sorts was going forward. There was no concealment or mysterious proceeding; everything was conducted openly, and exhibited with great civility; indeed, from all I saw in the country I am almost inclined to conclude that either the Chinese have greatly altered, or their wish to conceal and mystify everything, of which so much has been said, never existed.

The tea is brought to Canton unprepared. After its arrival it is first subjected to cleaning. Women and children are employed to pick out the pieces of twigs, seeds, and other impurities with which it happens to be intermixed. The only sorts which may be called natural are those gathered at different seasons: the rest are prepared by artificial means. Without entering into a description of all these processes, it may suffice to take one as an example. A quantity of *Bohea Saushung* was thrown into a spherical iron pan kept hot by means of a fire beneath. These leaves were constantly stirred about until they became thoroughly heated, when the dyes above mentioned were added, viz., to about twenty pounds of tea, one spoonful of gypsum, one of turmeric, and two or even three of Prussian blue. The leaves instantly changed into a bluish-green, and, having been stirred for a few minutes, were taken out. They, of course, had shrivelled and assumed different shapes from the heat. The different kinds were produced by sifting. The small longish leaves fell through the first sieve and formed Young Hyson, while those which had a roundish granular shape fell through last, and constituted Choo-cha, or Gunpowder.—*Hooker's Journal of Botany.*

ON THE JIPIJAPA (*Carludovica palmata*).

BY M. BERTHOLD SEEMANN.

AN indigenous production deserving especial notice is the *Jipijapa* (*Carludovica palmata*, R. et Pav.), a palm-like plant, of whose unexpanded leaves the far-famed "Panamá hats" are plaited. This species of *Carludovica* is distinguished from all others by being terrestrial, never climbing, and bearing fan-shaped leaves. The leaves are from six to fourteen feet high, and their lamina about four feet across. The spathe appears towards the end of the dry season, in February and March. In the Isthmus, the plant is called *Portorico*, and also *Jipijapa*, but the latter appellation is most common, and is diffused all along the coast as far as Peru and Chili; while in Ecuador a whole district derives its name from it. The *Jipijapa* is common in Panamá and Darien, especially in half-shady places; but its geographical range is by no means confined to them. It is found all along the western shores of New Granada and Ecuador; and I have noticed it even at Salango, where, however, it seems to reach its most southern limit, thus extending over twelve degrees of latitude, from the tenth N. to the second S. The *Jipijapa*, or Panamá hats, are principally manufactured in Veraguas and Western Panamá: not all, however, known in commerce by that name are plaited in the Isthmus; by far the greater proportion is made in Manta, Monte Christi, and other parts of Ecuador. The hats are worn almost in the whole American continent and the West Indies, and would probably be equally used in Europe, did not their high price, varying from two to 150 dollars, prevent their importation. They are distinguished from all others by consisting only of a single piece, and by their lightness and flexibility. They may be rolled up and put into the pocket without injury. In the rainy season they are apt to get black, but by washing them with soap and water, besmearing them with lime-juice or any other acid, and exposing them to the sun, their whiteness is easily restored. So little is known about these hats, that it may not be deemed out of place to insert here a notice of their manufacture. The "straw" (*paja*), previous to plaiting, has

to go through several processes. The leaves are gathered before they unfold, all their ribs and coarser veins removed, and the rest, without being separated from the base of the leaf, is reduced to shreds. After having been put in the sun for a day, and tied into a knot, the straw is immersed into boiling water until it becomes white. It is then hung up in a shady place, and subsequently bleached for two or three days. The straw is now ready for use, and in this state sent to different places, especially to Peru, where the Indians manufacture from it those beautiful cigar-cases, which fetch sometimes more than £6 apiece. The plaiting of the hats is very troublesome. It commences at the crown and finishes at the brim. They are made on a block, which is placed upon the knees, and requires to be constantly pressed with the breast. According to their quality, more or less time is occupied in their completion: the coarser ones may be finished in two or three days, the finest take as many months. The best times for plaiting are the morning hours and the rainy season, when the air is moist: in the middle of the day and in dry clear weather, the straw is apt to break, which, when the hat is finished is betrayed by knots, and much diminishes the value.—*Hooker's Journal of Botany.*

HYRACEUM.

WE understand that thirty barrels, each containing about one hundred weight of this drug, have recently been imported! After the late investigation of the nature of this substance, and the result, it is surprising that it should be considered a fit subject for a speculation. It ought to rank with "*album græcum*," and other disgusting remedies (?) long ago discarded from the *materia medica*.

ON THE MEANS OF DETECTING THE PRESENCE OF THE SYRUP OF FECULA IN THE SYRUPS OF THE SUGAR OF COMMERCE.

BY E. SOUBEIRAN.

I HAVE already published a note on this subject in the *Journal de Pharmacie et de Chemie* (vol. xviii., p. 328), and to that I shall refer the reader for all relating to the details on the use of the saccharometer; but some points in that notice were not sufficiently explained, and I have since had an opportunity of making further useful observations on the subject. These will form the object of the following memoir.

On the Syrup of Sugar.

Pure syrup of sugar at 35° is not precipitated by spirit containing 86 per cent. of alcohol, it does not become coloured to any extent when heated and boiled with a little caustic potash, nor does it redden when mixed with a few drops of ioduretted iodide of potassium.* The same syrup diluted with nine volumes of water, marks 52° to the right by the polariscope saccharometer; when heated in the water-bath with one-tenth of its volume of hydrochloric acid up to the temperature of 68°, and observed in a tube of twenty-two centimetres, it will be found to mark 20° to the left.

If the syrup has been made of sugar of an inferior quality, or has undergone a slight fermentation; or again, if the sugar has been used for preserving fruits, then it will contain inverted sugar. It acquires under these circumstances the property of becoming brown on the addition of potash; but it is not reddened by the ioduretted iodide of potassium, nor is it precipitated by alcohol, characteristics which distinguish it from syrup which has been mixed with syrup of fecula.

A syrup of this kind has the right-handed rotation weaker than that of the syrup of pure sugar; but after inversion, we find the left-handed rotation which would have belonged to this syrup.

This case is often met with in the analytical study of syrups, and it must be borne in mind, otherwise we may confound such syrups with those mixed with fecula.

Syrup of Sugar mixed with Syrup of Fecula.

A mixture of syrup of sugar and of syrup of fecula, when boiled with a small quantity of water and caustic potash, blackens and diffuses an odour of caramel.

* This reagent is prepared by dissolving 2½ grammes of iodide of potassium in 100 grammes of water, and then adding to the solution so much iodine that a portion of it shall remain undissolved. The liquor is retained on its excess of iodine.

On diluting the syrup with its volume of water, and adding a few drops of ioduretted iodide of potassium, the liquor becomes red. This is a marked reaction; by this means one-fiftieth of syrup of fecula is easily detected. For smaller quantities it is a good plan to have by the side of the glass in which the experiment is made, a second glass containing the same volume of water, to add the same quantity of the reagent in both of them, and then to compare the shades of colour. It whitens and precipitates when mixed with several times its volume of alcohol. The deposit is formed with difficulty, and at last we find at the bottom of the vessel a syrupy liquid, opaque but very thick.

This reaction is very hazardous, as in the hurried tests which have to be made at the dealers, we might be deceived by the deep brown colouration which the syrup would take under the influence of alcalies, which may result from the presence of inverted sugar. There is, however, not much fear of mistake, when, in addition to the colouration by potash, is added the character of the precipitation by alcohol, unless you were acting on syrup of gum; but the ioduretted iodide of potassium is a certain test. The red colouration which it produces is a manifest indication of the presence of the dextrine which always forms a part of the syrups of fecula of commerce. This reagent is furthermore useful in having nullified an argument used by the adulterators, founded on an exaggerated assertion of M. Bouchardat. This Chemist has asserted that glucose may be produced by the long exposure of syrup to heat, and that I had seen it formed after an ebullition of fifty hours. The fact in itself is questionable, and might form the subject of a controversy; but this is not of moment in the present instance, and it does not affect the opinion to be given on the adulterated syrups; for the presence of dextrine in syrups is a sufficient and incontestable proof of their adulteration.—*Journal de Pharmacie*.

NEW PROCESS FOR THE REDUCTION OF SILVER TO A METALLIC STATE BY MEANS OF SUGAR.

BY M. CASASECA.

THE silver of silver coin is first reduced to the state of chloride, and the weight of the alloy thus ascertained; the chloride, after having been well washed and freed from copper, is to be put into a stoppered, wide-necked bottle; a quantity of refined sugar, or sugar-candy, is then added, equal in weight, to the alloy. This is mixed with an equal volume of a solution, composed of 60 grammes of good hydrate of potash, and 150 grammes of distilled water, which will yield solution of potash of 25 degrees Baumé, or thereabouts; after closing the bottle, the mixture is to be agitated, and then left for twenty-four hours, shaking it occasionally, to favour the reaction. After this period has elapsed, it is to be washed several times, until the last washings, filtered, are not affected by nitrate of silver, a test which should be preceded by that of red litmus paper, which ought not to become blue, or show any change whatever. This done, the contents of the bottle are to be transferred to a porcelain capsule, by the help of a little distilled water, then, after being allowed to deposit, the excess of liquid is poured off, and the silver dried in a stove.

By these means we obtain that to which I have given the name of *grey silver*. This silver consists of some bright spangles, which become more brilliant on friction. It does not contain any impurities, with the exception of a small quantity of oxide and a few atoms of chloride of silver. This latter produces a slight turbidity in the liquor, when dissolved in perfectly pure nitric acid, and diluted with distilled water. This turbidity does not, however, prevent the formation of pure nitrate of silver; as the chloride, being only in suspension in the liquid, it is sufficient to filter it on a small portion of well-washed asbestos, in order to obtain an unobjectionable liquor. The nitrate of silver will not contain any trace of other metals, as none are used in the reduction of the chloride of silver, and by the reduction of this salt, the silver is completely separated from the iron and copper which the solution might contain. Thus the nitric acid of commerce may be employed, without inconvenience, for dissolving the alloy.

The *grey silver* almost always contains a small quantity of oxide; this is easily verified by the addition of ammonia, which, after digestion on the metal and filtration, produces a slight turbidity on adding nitric acid, which is caused by the separation of the dissolved chloride of silver; the turbidity is then increased by the addition of a small quantity of chloride of sodium to the nitrate of ammonia previ-

ously formed; thus, then, is the oxide of silver dissolved in the liquor in the state of ammoniacal nitrate, which is precipitated in the form of insoluble chloride.

Oxide of silver not being an impurity in the uses to which pure silver is applied in laboratories, we may consider the *grey silver*, obtained in the manner above described, as more pure, and with less loss, than any of those prepared up to the present time, by the reduction of chloride of silver; and *without the necessity of melting, a troublesome operation, and one of much inconvenience in a laboratory.*

From *una peseta* (one Spanish franc), the weight of which was 5.759 grammes, I obtained 4.750 grammes of *grey silver*; and supposing that the standard was at 90 per cent., which is doubtful, as the money of Seville has often an inferior standard, I obtained 91.6 per cent. of the silver contained in the alloy; but the remainder is not lost, as the waters of the washing acidulated by nitric acid are poured into the vessel on the precipitates of silver, and form a fresh chloride.

In making the mixture for the purpose of obtaining the *grey silver*, it will be observed, that the substance, which, in the first instance is white, changes to a dirty, reddish-brown colour, afterwards to a violet-tinted grey; and, finally, to a blackish-brown. It then is to be left quiet for about half an hour, at the end of which time, the whole of the bottle will be found entirely covered with a thin layer of brilliant silver, forming a complete cylindrical mirror. This layer will remain as long as the liquid is not much shaken.

The white silver, of which I treat in the memoir from whence this note is extracted, is obtained by precipitating oxide of silver, and oxide of copper, by potash; then reducing oxide of silver by sugar, taking certain precautions; but, from the alloy only 46 per cent. of silver is obtained. In the state of dead silver, it is as white as pumice-stone; and, by simple friction with a glass rod, it assumes considerable brilliancy. The white silver is free from oxide or chloride—it is *chemically pure*.—*Comptes Rendus.*

PRIZE PROPOSED TO BE GIVEN BY THE SOCIETY OF PHARMACY OF PARIS FOR AN ESSAY ON RACEMIC ACID.

THE Society of Pharmacy of Paris will award, in 1853, a prize of the value of 1500 francs to the author of a memoir in which the two following questions are answered:—

“Do tartars exist which contain racemic acid already formed?”

“Determine the circumstances in which tartaric acid may be converted into racemic acid.”

Racemic or paratartaric acid was found by M. Kastner, of Thann, in the manufacturing of tartaric acid. In 1819 John showed that this acid differed from all known acids; ten years later Gay-Lussac and M. Walchner, in a memoir of theirs, proved that it is isomeric with tartaric acid.

The two acids have the same origin; tartaric acid is extracted from the tartar of wine; it was in the treating of tartar that racemic acid was obtained. The two acids have exactly the same composition, and the identity is retained even in their saline combinations. They are in fact two isomeric bodies, alike in their composition, distinct in their properties. They have the same elements united in such a manner as to form two different molecules. Circular polarization has confirmed this, for whilst tartaric acid has a right-handed rotatory power, racemic acid is devoid of the power of rotation. Furthermore, M. Pasteur, penetrating more deeply into their constitution, has been able to prove that racemic acid is itself composed of two different acids, namely, dextroracemic acid, which is confounded with tartaric acid, and levoracemic acid, which differs from it in particular by its left-handed rotation; so that the neutral rotation of racemic acid results from the mixture in equal parts of two acids, both having rotatory power, but in contrary directions.

Racemic acid has only been obtained once, and then accidentally. Since its discovery by M. Kastner, no one has succeeded either in finding it or making it. Nevertheless it is one of the known isomeric bodies which is of the greatest interest.

It becomes important to ascertain if this acid exists already formed in certain tartars of wine, if the locality in which the grape is grown, and if the circumstances in the manufacture of the wine have any influence on its formation. This can only be effected by obtaining tartars from different localities and submitting them to analyses. This would not demand a great sacrifice of time, as it would suffice to ascertain the rotatory power of the tartars, to obtain immediately a satisfactory

notion. It may also be possible that the racemic acid obtained by M. Kastner did not pre-exist in the tartar which he used, but that it was formed under the influence of some circumstances in the operation which might have passed unperceived. The transformation of tartaric acid into racemic acid is by no means improbable, and we have already an example of an analogous transformation in an experiment of M. Pasteur, who has found levoracemic acid to assume right-handed rotation when racemate of lime had been dissolved in hydrochloric acid. The competitors for this prize will have to seek to determine the circumstances under which the passage of tartaric acid to that of racemic acid takes place.

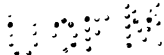
The memoirs, written in French or in Latin, are to be forwarded post free and under seal, before the 1st of July, 1853, to M. Soubeiran, General Secretary to the Society of Pharmacy, 21, Rue de l'Arbalète, Paris.—*Journal de Pharmacie*.

AMORPHOUS PHOSPHORUS.

(Specification of Patent.)

"To all to whom these presents shall come, I, Arthur Albright, of Birmingham, in the county of Warwick, Manufacturing Chemist, send greeting: whereas her present most excellent Majesty Queen VICTORIA, by her royal letters patent bearing date at Westminster the seventeenth day of July, in the fifteenth year of her reign, did give and grant unto me, the said Arthur Albright, my executors, administrators, and assigns, her special licence, full power, sole privilege and authority, that I, the said Arthur Albright, my executors, administrators, and assigns, and such others as I, the said Arthur Albright, my executors, administrators, and assigns, should at any time during the continuance of the said grant agree with, and no others should and lawfully make, use, exercise, and vend within that part of the United Kingdom of Great Britain and Ireland called England, the dominion of Wales, and town of Berwick-upon-Tweed, an invention communicated to me by a certain foreigner residing abroad, namely, Professor Anton Schrötter, of Vienna, in the empire of Austria, of "Improvements in the Manufacture of Phosphorus and in the Apparatus to be used therein," in which said letters patent there is a proviso obliging me, the said Arthur Albright, particularly to describe and ascertain the nature of the said invention, and in what manner the same is to be performed, by an instrument in writing, under my hand and seal, and to cause the same to be enrolled in her said Majesty's High Court of Chancery within six calendar months from the date of the said grant, as in and by the same reference being thereunto had, will more fully and at large appear. Now know ye, that in compliance with the said provisions, I, the said Arthur Albright, do hereby declare that I have hereinafter particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, reference being had to the drawings annexed, and to the figures and letters marked thereon (that is to say)—

"The invention consists in a mode of producing an improved manufacture of phosphorus which is amorphous or non-crystalline, and differing both in its nature and properties from the ordinary phosphorus of commerce, and also relates to the apparatus to be used there for. Phosphorus of commerce is well known to be crystalline in formation, of a pale yellow colour, approaching, when pure, to a white, nearly transparent, luminous in the dark, and burning in the open air at a temperature of about 148° Fah. But the amorphous phosphorus is opaque, of a varying red colour, is not luminous in the dark, does not take fire when exposed to an ordinary atmosphere, nor even by friction or percussion, unless the temperature produced thereby exceeds 464° Fah., the ordinary temperature at which this amorphous phosphorus is inflammable being about 482° Fah., but when combined with chlorate of potass or other appropriate materials it inflames with great energy, and may therefore be used in the manufacture of lucifer matches and other instantaneous igniters. It is, moreover, free from those pernicious qualities which render the application of ordinary phosphorus to these last-named purposes so dangerous to health. In a commercial point of view the amorphous phosphorus possesses a great advantage over the crystalline, inasmuch as the former may be transported with perfect safety, while the carriage of the ordinary phosphorus is attended with considerable trouble and risk, and consequent expense. By this conversion of condition the phosphorus is deprived of its poisonous quality, and of much of the peculiar and unpleasant smell which arises from the common article, neither is it so liable in warm tem-



peratures to convert into phosphoric acid. I will now refer to the drawings annexed, and afterwards describe the process which I employ for the manufacture of amorphous phosphorus, premising that the *modus operandi* is susceptible of several modifications. The manufacture of the phosphorus of commerce is well known and understood, and as I employ manufactured phosphorus for conversion to an improved state, there is no necessity for entering into any description of its manufacture. Δ Δ is a cast-iron vessel, set in brick-work, in the ordinary manner of a furnace, having a fire-place beneath of the ordinary construction. From the inside of the flange of this vessel a similar vessel, ∇ ∇ , of the same material is suspended, and made fast by means of the screw-pins, r r , as shown in section in fig. 1, and by r r in plan, fig. 2. The space between the two vessels contains a metallic bath, composed of a mixture of tin and lead in equal parts. α is a cast-iron cover to the inner vessel, ∇ fitting the top edge by means of a groove, and fastened to the outer vessel, Δ , by the screw-pins h h , fig. 1, and h h h , fig. 2. A screw, f , passes through a three-armed iron holder, z z , fig. 1, and z z z , fig. 2, which is made fast to a third moveable iron vessel, c c , placed in a sand-bath shown by n n . In the interior of this iron vessel, c c , another vessel of glass or porcelain, d d , is fitted, in which the phosphorus to be operated on is placed. j is a curved pipe of iron or copper passing freely through the cover, α , but screwed into the cover, ∇ , and having an exit at the extremity into a detached vessel, k k . This contains mercury or water. If the first is employed it is well to cover it with water. This pipe, j , will act as a safety-valve as the metal or water in the vessel, k k , will prevent the return of the atmospheric air into the inner vessel c c . w is a spirit-lamp, placed, if it is necessary, under the pipe, j , for the purpose of keeping the same hot, so that clogging of the pipe by the condensation of distilled phosphorus may not occur. x is a stop-cock to prevent the ingress into c c of the contents of k k , or of the atmospheric air, and should be closed before the apparatus in the furnace is allowed to cool down, or the vessel, k k , is removed.

"I may here observe that the cover α is used chiefly as a means of preventing accidents, and is not essentially necessary. Between the end of the screw f and the cover ∇ , a small but strong concave disc or spring of steel should be inserted, and so adjusted as to give a slight play to the cover ∇ , in case of violent action arising in the interior, or the stopping up of the pipe j . Neither of these accidents is likely to occur if the operation is conducted with proper attention. The whole apparatus as represented, is set in brick-work, with suitable furnace and flues for the purpose of heating it, and maintaining the temperature required for the process; the phosphorus to be converted into an amorphous state to be previously melted and cooled under water, and dried as much as possible. The mode of operation is then as follows: The cover of the inner vessel is to be raised, the phosphorus deposited, and the covers ∇ and α replaced.

"A fire is then made under the outer vessel, Δ , and the temperature raised to such a degree as shall be sufficient to drive off the air and also the gases which may be generated in the interior vessel, which will escape at the exit of the pipe j , which dips into the vessel k k , covered with quicksilver or water, as before described. The action of water in the vessel k k , when quicksilver is employed, is useful, in order that any phosphorus which may distil over and pass down the pipe j , may be covered thereby.

"The temperature is to be gradually raised, until bubbles escape at the end of the pipe j , which take fire as they enter the air. When these bubbles have escaped freely for some time, the temperature may be raised, until Δ has attained a point of 500° Fah. In order to judge of the temperature a thermometer is placed in the metallic bath before described. The temperature must be maintained for a certain time, the length of which depends so much on accompanying circumstances, that it can only be determined by experience, at a point within a few degrees of the before-mentioned elevation, perhaps higher than lower.

"So soon as the phosphorus is converted into an amorphous state the vessel may be allowed to cool down. The phosphorus is then taken out, to effect which it may be necessary to break the glass or porcelain vessel.

"It may be desirable to increase the pressure on the vessel c c and d d , and for this purpose the vessel k k should be deepened, so as to contain more mercury, and by this means a pressure of an atmosphere or even more may be gained. In this case it will be necessary to remove the disc or spring so soon as the steam and firey bubbles which arise in the first part of the process have ceased to appear at the end of the pipe j .

"The phosphorus is then to be levigated under water, from which it may be drained by being placed in a bag or on a filter. If the operation has been successfully conducted, the amorphous phosphorus produced contains only very slight traces of common phosphorus. The levigated phosphorus, while moist, should, in order to purify it, be then spread thinly for convenient working on separate shallow trays of sheet iron or lead, and these trays can be so placed alongside each other as to receive the heat of steam, or of a heated bath of water, or of chloride of calcium, or of sand, or of each consecutively, in this order; but whichever be employed, the temperature must be raised gradually, and the phosphorus frequently stirred until the disappearance in the dark of all luminous vapour shall show that the whole of the adhering crystalline phosphorus has become oxidized. The operator should have water at hand to quench any fire that might arise before the whole mass was perfectly oxidized. When the process of purification is thus far completed, the phosphorus must be washed until the water in which it is so washed shows no trace of acid when tested.

"In case the amorphous phosphorus produced contains too large a proportion of the unconverted phosphorus, then bisulphuret of carbon or other solvents may be employed to wash out the ordinary phosphorus.

"From the foregoing it will be seen that for the conversion of phosphorus I employ but one agent, namely, heat, but I reserve to myself the right to make use of other agents in combination with heat to facilitate or accelerate the production of amorphous phosphorus, and I wish it to be understood that I do not confine myself to the precise details set forth and shown of the apparatus hereinbefore described; but I claim as a new and useful invention the manufacture of an improved, or amorphous, phosphorus, and the apparatus described to be used in such manufacture.

"In witness whereof I, the said Arthur Albright, have hereunto set my hand and seal this 16th day of January, in the year of our Lord, 1852.

"ARTHUR (L. S.) ALBRIGHT.

"Taken and acknowledged by Arthur Albright (party hereto) at Birmingham, in the County of Warwick, this 16th day of January, 1852.

"Before me, J. R. BLOXHAM, a Master Extraordinary in Chancery.

(The Agents for this patent are Messrs. Barlow and Payne, Chancery Lane.)

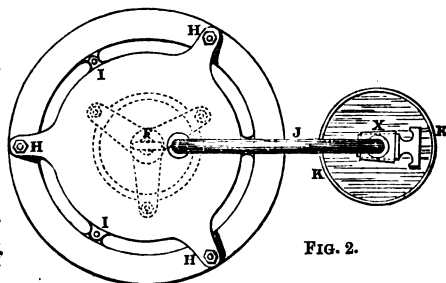
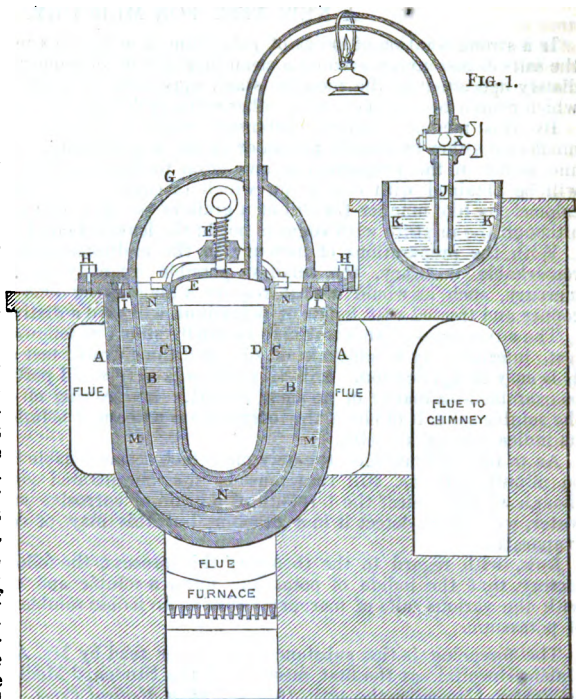


FIG. 2.

A NEW TEST FOR MERCURY.

If a strong solution of iodide of potassium be added to a minute portion of any of the salts of mercury, placed on a clean bright plate of copper, the mercury is immediately deposited in the metallic state, appearing as a silvery stain on the copper, which cannot be mistaken, as no other metal is deposited by the same means.

By this method corrosive sublimate may be detected in a drop of solution unaffected either by caustic potash or iodide of potassium. In a mixture of calomel and sugar in the proportion of one grain to two hundred, a distinct metallic stain will be obtained with one grain, which of course contains 1-200th of a grain of calomel; in like manner 1-400th of a grain of peroxide of mercury may be detected, although the mixture with sugar is not in the least coloured by it.

With the preparations of mercury in the undiluted state, this process acts with remarkable accuracy, the smallest possible quantity of calomel or peroxide of mercury, such as would almost require a magnifying lens to perceive, placed on copper and treated with iodide of potassium, will give a distinct metallic stain.

The advantages of this test may be briefly stated as follows:—1st. It is a delicate test, inferior only to chloride of zinc and the galvanic test of zinc and gold. 2nd. It is easy of application. 3rd. It requires a very small portion of the substance to be examined—a matter of no small import. 4th. Acting on the insoluble as well as the soluble salts, it obviates the intermediate process of solution. 5th. When it acts its indications are decisive.

As to its disadvantages, the only one which seems tenable is, that although it acts on minute portions, still that must be in a concentrated condition. For instance, though we may detect the 1-1000th of a grain of corrosive sublimate in a drop of water, we cannot detect it in a drachm; but this may of course be remedied by evaporation.

Now, with regard to the theory of this process, the following seems most satisfactory, that the iodide of potassium forms a soluble and easily decomposed salt with the various salts of mercury: that is, an iodide soluble in excess of the iodide of potassium.

The foregoing is the substance of a paper read by Mr. Arthur Morgan, City of Dublin Hospital, at the first meeting of the Students' Medico-Chirurgical Society, on Friday, December the 12th, 1851.—*Dublin Medical Press.*

CEMENT FOR MENDING CHINA, &c,

TAKE of isinglass two drachms, sprinkle it with water and allow it to stand until softened, then add as much proof spirit as will rather more than cover it, and dissolve with a moderate heat. Take of gum mastic one drachm, dissolve it in two or three drachms of rectified spirit. Mix the two solutions, and stir in one drachm of gum ammoniacum, previously reduced to fine powder and rubbed down with a little water. Evaporate, if necessary, in a water-bath to a proper consistence. Keep the cement in a bottle. When required for use plunge the bottle in warm water, and apply the cement with a stick or small hard brush to the china previously warmed. Compress the pieces firmly together until cold, taking care to make the contact perfect, and using a very thin layer of cement. When properly applied the cement is almost, if not quite, as strong as the china itself, unless exposed to the combined action of heat and moisture.

Another cement, useful for many purposes, may be made by dissolving isinglass in glacial acetic acid and reducing it to the consistence of a thin jelly. It may be applied in the same manner as the above, but does not require to be warmed.

ON THE TREATMENT OF FAT IN THE PREPARATION OF CANDLES.

BY MM. MASSE AND TREBOULLET, OF NEUILLY.

It is known that fat may be made to acquire a soapy character by the influence of sulphuric acid. In the manufacture of candles the fat is heated with sulphuric acid or is subjected to mechanical friction therewith; it is then washed, and the mass being placed in a still, is heated to between 200° and 250°, to drive off the aqueous vapour, and with it the fatty acids. With palm-oil, the effect of this treatment is as follows:—Palm-oil melts at 30°; after the action of sulphuric acid at 38°; after the washing with water at 44.5°; after the distillation at 46°. The first product of distillation liquifies at 54.5°, the point of liquefaction then sinks, and the product

comes gradually more and more to have a tendency to crystallize. If the entire product be pressed together, the mass has a melting-point of 54.5° , the same as that which first passed over. Other fats present considerable differences in these respects. A presentation of these experiments has been requested by a commission.—*Bulletin de la Société de l'Encouragement*, July, 1851, and *Chemisch-Pharmaceutisch. Central-Blatt*, Nov. 1851.

AN IMPROVED MODE OF PREPARING CAFFEIN.

BY H. J. VERSMANN, APOTHECARY, LUBECK.

THE use of coffee, in Europe, is not yet two hundred years old; it was first introduced into Paris in the year 1669. Since that date the consumption of coffee has gradually increased, and, especially in France and Germany, has reached to so great an extent, that coffee is one of the most important objects of commercial speculation; indeed, it is now a real article of diet. It is not only drunk by the higher classes of society, but more particularly by the middle and lower classes, to which it is now a necessary. The consumption of coffee, in the year 1840, in the Zollverein, was equal to two pounds eleven loths (a loth is equal to $\frac{1}{4}$ oz.) per caput. This is much exceeded in the Northern German States, where its price is not raised by a heavy duty, and where, therefore, the occasion does not exist for the employment of its substitutes—burnt chicory, grapes, &c.; a proof of this assertion is to be found in the report from Rio Janeiro, that the consumption of Brazilian coffees, in Germany and Austria, during the past year, amounted to 71,479,040 pounds.

All substitutes for coffee fail in their object; inasmuch, as they are wanting in that which particularly they should contain, the essential active ingredient, caffein. Coffee and caffein are seldom employed for medicinal purposes, probably less than they should be. Formerly coffee was employed, in some countries, as a remedy in ague, and it is very probable that caffein deserves commendation for this purpose. In many cases it may be preferred to quinine, as it is more easily borne by the system, and leaves no ill effects behind. More recently, caffein has been employed by a certain physician, in hysterical headaches, attended with other symptoms, and has given the author several occasions for the preparation of this substance.

The statements of the proportion of caffein in coffee have been so various, that it has seemed to the author desirable to contribute his own researches. He first confines himself to the reproduction of a few of these statements. Pfaff, who early directed his attention to the determination of the quantity of caffein in coffee, found that the fresh berry contains $\frac{1}{100}$ th of caffein; Pagen states the proportion at five times as much; and Robiquet asserts, that roasted coffee contains $\frac{1}{100}$ th of caffein. In Wigger's *Grundriss der Pharmakognosie*, second edition, it is stated, that Robiquet gives the following proportions of caffein in different kinds of coffee:—Martinique coffee, 6.4; Alexandrian, 4.4; Java, 4.4; Mocha, 4.0; Cayenne, 3.8; St. Domingo, 3.2 per cent. It is most probable that 0.64 per cent. is a common proportion, and that coffee cannot, generally, contain so large a quantity as above stated. In M. Liebig's *Handbuch der Chemie*, the following quantities are given from Robiquet and Boutron:—

1 pound of Martinique coffee.....	32 grains of caffein
1 “ Alexandrian.....	22 “ “
1 “ Java.....	22 “ “
1 “ Mocha.....	20 “ “
1 “ Cayenne.....	19 “ “
1 “ Domingo.....	16 “ “

The discrepancies in these statements may be explained on several grounds. First, the difference of the coffee, according to its commercial quality, and the character of the place where it was gathered; then the method of preparing the caffein, the care with which the coffee was bruised; and, lastly, the quantity employed in the operation.

All the authors have prepared caffein from good Brazilian coffee, and have operated on quantities of five, ten, and one hundred pounds. In the preparation of caffein, the direction is usually given to boil the raw coffee-berries, to combine it with oxide of lead, and then to separate it by sulphuric acid. This plan the author has tried, but has found it rather unprofitable, and has gained but little profitable results. By the boiling, the gum, and the mucus with which the oil is combined in coffee were dissolved, and the separation of the pure caffein is rendered difficult. On the other hand, he recommends the following process, as simple and suitable to the purpose:—Ten parts of bruised coffee are mixed with two parts of caustic lime, previously converted

into hydrate of lime. This mixture is placed in a displacement apparatus, with alcohol of 80°, until the fluid, which passes through no longer, furnishes evidence of the presence of caffen. The coffee is then roughly ground, and brought nearly to the state of a powder, and the refuse of the already once digested mixture from the displacement apparatus dried, and ground again, and, mixed with hydrate of lime, is once more macerated. The grinding is more easily effected after the coffee has been subjected to the operation of alcohol, having lost its horny quality, and the caffen is thus certainly extracted. The clear alcoholic fluid thus obtained is then to be distilled, and the refuse in the retort to be washed with warm water to separate the oil. The resulting fluid is then evaporated until it forms a crystalline mass, which is to be placed on a thick filter, and the moisture expressed. The moisture, after evaporation, still furnishes some caffen. The impure caffen is freed from oil by pressure between folds of blotting paper, and purified by solution in water with animal charcoal, and is afterwards obtained in shining, white, silky crystals. In general, not more than three drachms were procured from five pounds of coffee, from ten pounds seven drachms, and from one hundred pounds, the largest quantity, viz., six ounces and four scruples, of caffen; a proof, that a large quantity must be operated upon if, in a quantitative respect, a satisfactory result is to be obtained. Thus it is seen, that good Brazilian coffee contains 0.57 per cent. of caffen. At the same time it may be observed, that it contains about ten per cent. of a green liquid oil, and two per cent. of a yellow, firm fat (Palmitin).—*Archiv der Pharmacie*, November, 1851.

PROCEEDINGS OF THE CONVENTION OF PHARMACEUTISTS AND DRUGGISTS, HELD IN THE CITY OF NEW YORK, OCT. 15, 1851.

IN pursuance of a call issued by the College of Pharmacy of the city of New York, a Convention of Delegates from the different Colleges of Pharmacy in the United States, assembled at the College Rooms in New York, at five o'clock, P.M., on Wednesday, the 15th of October. Delegates from Philadelphia and Boston were in attendance. The Maryland College (at Baltimore) and the Cincinnati College were not represented, although delegates from each had been previously reported to the committee of arrangements in New York. A communication of some length was received from the Cincinnati delegation.

The convention was organized by calling Mr. Charles Ellis, of Philadelphia, to the Chair, and Dr. Samuel R. Philbrick, of Boston, to act as Secretary *pro tem*. A committee was then appointed by the nomination of each delegation, consisting of Messrs. Samuel M. Colcord, of Boston, Alfred B. Taylor, of Philadelphia, and George D. Coggeshall, of New York, to examine credentials, and nominate officers for the convention. The committee retired, and on their return reported the credentials satisfactory, and proposed Dr. C. B. Guthrie,* of New York, as President, and Mr. Alfred B. Taylor, of Philadelphia, as Secretary, who were unanimously confirmed.

Dr. Guthrie, on taking the chair, made a few remarks, expressive of his sense of the honour conferred, by appointing him presiding officer of the first convention of the kind ever held in the United States, and explanatory of the objects of the convention, which were in accordance with the growing feeling amongst Druggists and Pharmacutists, of the necessity to establish standards of the qualities of imported drugs and medicines, for the government of the United States Inspectors at the different ports, and, in addition, to act upon such matters of general interest to the profession, as may be presented to the consideration of the convention.

Two Reports were presented by the New York Delegation; one from Messrs. Guthrie and Coggeshall, and the other from Mr. Merrick, embodying their views upon the subject of standards, and also in regard to false drugs which should be excluded. Some difference of opinion existed in reference to the admission of certain kinds and qualities of drugs, which, although in demand, were deemed by the

* To those who are not acquainted with Dr. Guthrie, it may appear singular that the President of a Pharmaceutical Convention should be a Physician. To such we will say, that Dr. Guthrie, though a graduate of medicine, and at one time a practitioner, has for many years past been a Druggist. The deep interest taken by Dr. G. in the working of the law for the inspection of imported drugs, and his position in the New York delegation, very naturally suggested his name as chief officer of a convention specially called in reference to that Act.—Ed. *American Journal of Pharmacy*.

majority as not contributing to the benefit of medicine; and as, perhaps, affording inducements to the designing.

A communication from the Cincinnati delegates was read, after which Mr. Restieaux, of Boston, read an interesting statement of the working of the drug-law in that city. A letter from Dr. David Stewart, inspector of drugs at Baltimore, and a member of the Baltimore delegation, who was unable to be present, was also read, expressing his views in regard to the subject.

A general discussion ensued upon various topics connected with the business of the convention, and resulted in the appointment of a committee, consisting of Messrs. Proctor, of Philadelphia, Restieaux, of Boston, and Coggeshall, of New York, to consider the several communications, and arrange the general plan of business, and report at the next sitting.

The convention then adjourned to Thursday, at twelve o'clock.

Second Sitting, Oct. 16th.—The convention met at twelve o'clock. The committee appointed yesterday made a report in reference to the special object of the convention, followed by a preamble and resolutions in reference to a general organization of Pharmacutists throughout the United States, which was read.

The Report was considered in sections, with full, deliberate, and very interesting discussion, in which the members generally participated, and after some amendments, the following portions of the document, which embrace the views and recommendations of the convention, were adopted:

"1. We consider that the law is already ample in its general provisions, in guarding the admission of drugs, medicinal substances, and preparations, under the reference which it distinctly requires, to the Pharmacopœias and Dispensatories specified in it; we think it right to designate a few prominent articles for which positive standards are required.

"2. All drugs and chemicals employed in manufacturing *chemical preparations* used in medicine, may be admitted of less than standard purity, upon sufficient bonds being given, that such articles are solely to be devoted to said uses.

"3. Opium should not contain less than *eight* per cent. of pure morphia, unless intended for manufacturing [into morphia, codeia, and other chemical principles. *Ed.*] as above stated.

"4. Two varieties of scammony should be admitted, '*Aleppo cake scammony*,' that contains not less than 40 per cent. of *true scammony resin*; and the so-called *Virgin scammony*, that contains not less than 65 per cent. of the same resinous principle.

"5. All elaterium not containing 25 per cent. of *elaterin* should be rejected.

"6. Iodine, unless intended expressly for manufacturing, should not contain more than 3 per cent. of water, and should be free from all other impurities.

"7. Gum resins, used solely in medicine, as *assafœtida*, *ammoniac*, &c., should be rejected when they contain more than 15 per cent. of extraneous matter, whether accidental or designed.

"8. Barks derived from the Cinchonas, growing in the northern Provinces of South America, and which contain *cinchonina*, with or without *quinia*, should be admitted; all other barks, falsely sold as cinchona bark, should be rejected. [This section is intended to apply to the false barks derived from the region mentioned, Brazil, and the West Indies, which contain none of the cinchona alkaloids, and not to the Peruvian barks properly so called.—*Ed.*]

"9. As there is no good reason for the introduction of European rhubarb into this country, owing to its inferior strength, we recommend that all rhubarb of European origin be excluded. [This section was introduced with a view to guard against the importation of cheap European rhubarb, for the purpose of adulterating the Asiatic varieties, it having been used for that purpose.—*Ed.*]

"10. The uninjured portion of partially damaged drugs, &c., may be admitted, provided the importer will, under the superintendence of the Inspector, cause all the damaged portions to be removed:—and drugs otherwise good, if loosely admixed with extraneous substances, to an extent that, in the proper construction of the law, would cause them to be rejected, may be passed, if the importer will remove all such extraneous parts under the direction of the Examiner.

"11. It is recommended, that the Examiner of each port be required to collect and deposit in his office a cabinet of specimens of drugs, chemicals, and permanent medicinal preparations, as complete as practicable, to be used for comparison in the course of inspection.

"12. And, finally, this Convention respectfully and earnestly recommends, as the useful working of the law, after all, depends mainly on the integrity and ability of the Examiners, that the greatest carefulness should be exercised, by the appointing power, in the selection of these officers; in furtherance of which, the Colleges of Pharmacy would cheerfully render their assistance if solicited."

The Convention having disposed of that portion of the Report which related to the object for which it was more especially called, the Preamble and Resolutions brought forward by the Committee were considered and adopted, viz:—

"Whereas, The advancement of the true interests of the great body of Pharmaceutical Practitioners, in all sections of our country, is a subject worthy of earnest consideration; and whereas, Pharmacutists, in their intercourse among themselves, with Physicians and the public, should be governed by a code of ethics calculated to elevate the standard, and improve the practice of their art; and whereas, the means of a regular Pharmaceutical education should be offered to the rising Pharmacutists, by the establishment of Schools of Pharmacy in suitable locations; and whereas, it is greatly to be desired, that the united action of the profession should be directed to the accomplishment of these objects; therefore,

"Resolved, That, in the opinion of this convention, much good will result from a more extended intercourse between the Pharmacutists of the several sections of the Union, by which their customs and practice may be assimilated; that Pharmacutists would promote their individual interests, and advance their professional standing, by forming associations for mutual protection, and the education of their assistants, when such associations have become sufficiently matured; and that, in view of these important ends, it is further

"Resolved, That a convention be called, consisting of three delegates each, from incorporated and unincorporated Pharmaceutical societies, to meet at Philadelphia, on the first Wednesday in October, 1852, when all the important questions bearing on the profession may be considered, and measures adopted for the organization of a National Association, to meet every year."

In accordance with these resolutions, it was resolved, that the President of the Convention be requested to transmit an invitation to the authorised bodies, at least three months previous to the time of meeting, desiring such bodies to acquaint him with the names of the delegates they may appoint.

On motion, it was resolved, that the New York delegation be appointed a committee to lay the report and proceedings of this convention before the Secretary of the Treasury of the United States, and afterwards to have them published in pamphlet form.

Dr. Philbrick, of Boston, offered the following preamble and resolution, which were adopted:—

"Whereas, To secure the full benefit of the prohibition of sophisticated drugs and chemicals from abroad, it is necessary to prevent home adulteration, therefore,

Resolved, That this convention recommend to the several Colleges to adopt such measures as in their respective States may be best calculated to secure that object.

On motion of Mr. Colcord, of Boston, it was

Resolved, That a committee of three be appointed by this convention to act as a standing committee, to collect and receive such information as may be valuable, and memorials and suggestions from Medical and Pharmaceutical associations, to be presented to the next convention.

The President appointed G. D. Coggeshall, of New York, S. M. Colcord, of Boston, and W. Procter, jun., of Philadelphia, as the committee.

A vote of thanks to the officers was passed, and then the convention adjourned, to meet in Philadelphia on the first Wednesday in October, 1852.—*American Journal of Pharmacy.*

REPORT OF A JOINT COMMITTEE OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY AND THE PHILADELPHIA COLLEGE OF PHARMACY, RELATIVE TO PHYSICIANS' PRESCRIPTIONS.

(Published by order of the Board of Trustees of the Philadelphia College of Pharmacy.)

THE joint Committees of the Philadelphia County Medical Society, and of the Philadelphia College of Pharmacy, appointed for the purpose of considering the

means best adapted to prevent the occurrence of mistakes in the compounding of the prescriptions of Physicians by Apothecaries, beg leave to report, that they have given to the subject all the attention that its importance demands, and present the following hints as the results of their joint deliberations. They have taken the liberty of adding, also, a few general hints on the relations that should exist between Physicians and Pharmacutists.

A. In respect to Physicians.

1. Physicians should write their prescriptions carefully and legibly, making use of good paper, and, whenever possible, of pen and ink. When obliged to write with a pencil, they should take the precaution to fold the prescription twice, so as to prevent its being defaced.

2. The nomenclature of the United States Pharmacopœia is becoming annually more in favour with Pharmacutists; a statement attested by the fact, that 1500 copies of the book of Latin labels for shop furniture, published by the Philadelphia College of Pharmacy, have been disposed of within three years. Physicians are also becoming more alive to the merits of our national Codex, and they are respectfully urged to familiarize themselves with its nomenclature, and to adhere to it strictly in their prescriptions.

3. The numerous treatises on *Materia Medica*, Pharmacy, and the Practice of Medicine, of English origin, that are reprinted in this country, notwithstanding they are generally interlarded with the formulæ of our own Pharmacopœia, tend, nevertheless, very much to confuse the Physician and Apothecary in the use and exact meaning of terms in prescriptions. To obviate the difficulties thus occasioned, the Physician should, when he prescribes a medicine which is not official, nor in common use, state on his prescription, either in a note at the bottom, or within parenthesis, following the article, the authority or work from whence it is derived, as "Griffith's Formulary"—"Ellis' Formulary"—"Braithwait's Retrospect," &c.

4. Physicians would lessen the risk of errors in their prescriptions, and increase the chances of their detection, should they be made, by observing the following hints:—

1st. Write the name of the patient at the top of the prescription, unless a good reason prevents this being done; in which case, it should be expressed as for Mr. G—, Mrs. R—, or Mrs. S—'s child, or for Master T—, so as to convey to the Apothecary some idea of the age of the patient.

2nd. The date, and name of the physician, or his initials, should always be appended, and, whenever practical, the dose, and mode of administering the medicine directed.

3rd. When an unusually large dose of an active medicine is prescribed, as opium, morphia, elaterium, strychnia, &c., let such names be put in *italics*, and the quantity or quantities repeated in writing, enclosed within a parenthesis; thus:—*℞ Morphiæ Sulphatis*, grs. vj. (six grains.) Div. in chart. vj.

4th. When an active substance is to be used externally, it should be so stated on the prescription; thus, "For external application,"—"To be applied to the part as directed," &c.

5th. The quantities of each article should be placed in a line with the name, and not below it; and in using the Roman numerals, the i's should be dotted correctly.

6th. The occasional practice of writing the directions intended for the patient in *Latin*, and especially in abbreviated *Latin*, is uncalled for, and attended with some risk; it is far safer to write them in English, and without abbreviation or the use of figures, unless these are well and distinctly formed.

B. In Respect to the Apothecary.

1st. The Apothecary should hesitate to dispense a prescription, the handwriting of which is so imperfect as to render the writer's meaning doubtful, especially if it involves agents of a poisonous or irritating character, unless he is able, from collateral circumstances, to satisfy himself of the intent of the prescriber. In such a case he should delay the delivery of the medicine to the patient until he can see the Physician, and in doing so he should avoid committing the latter by agreeing to send the medicine when it is ready.

2nd. The Apothecary is justified in the same means of delay, if he, after deliberate

consideration, believes that the Physician has inadvertently made a mistake in the quantity or dose of the article or articles prescribed; always keeping in view the Physician's reputation as well as his own. Every respectful application, in such cases, to a Physician, should be met in good faith and with kind feeling, even though no error should prove to exist.

3rd. In his demeanour and language the Apothecary should cautiously avoid compromising the Physician, unless it be unavoidable, in which case honesty is the best policy, and the patient or his messenger should be told that it will be necessary to have an interview with the Physician previously to compounding his prescription.

4th. The Apothecary is not justifiable in making inquiries relative to the patient or his disease, or remarks relative to the character or properties of the medicines prescribed, that are uncalled for, or likely to convey a wrong impression, through an ignorant messenger, to the patient, excepting it be done in a case where he has doubts in regard to the prescription, and wishes to satisfy himself; and here he should act with great discretion.

5th. When an Apothecary is asked his opinion of a Physician's prescription in a manner that indicates want of faith in the prescriber, he should waive the question, unless by a direct answer he should be able to restore that confidence. When asked the nature of the ingredients he should be guided in his answer by circumstances, avoiding to give the desired information, when he believes it would be contrary to the wish of the Physician, or attended with injurious consequences. In other cases he should use his own judgment.

6th. Physicians being often unacquainted with practical Pharmacy, pay little attention to the order in which the several articles entering into a prescription are arranged, with the view to facilitate the operations of dispensing. It hence becomes the first duty of the Apothecary carefully to read the prescription and fix the proper order in his mind. He should, at the same time, acquire the habit of considering the quantities ordered in relation to the usual doses, and also the general bearing of the prescription; and a constant resort to this practice, based on due knowledge, must almost inevitably detect mistakes, if any have been made.

7th. Apothecaries should accustom their assistants to study prescriptions in this light, and to acquire such a knowledge of the doses and therapeutical uses of medicines as shall serve to guide them in avoiding errors.

8th. The Apothecary, when engaged in dispensing a prescription, should, as far as possible, avoid mental pre-occupation, and give his attention fully to his task. He should acquire the habit of *always* examining the label of the bottle before using its contents, and he should satisfy himself that he has read the prescribed quantity correctly, by referring to the prescription anew before weighing out each article. It is also a useful precaution to have bottles containing mineral or vegetable poisons distinguished by some prominent mark.

9th. As the conscientious discharge of his duty should be the aim of every Apothecary, seeing that on his correct action depends, in no slight degree, the usefulness of the Physician, no pains should be spared to secure the efficiency of the medicines dispensed, whether they be drugs or preparations. The latter should always be prepared of full strength, and according to the formulae recognized by the United States Pharmacopœia, unless when otherwise specially ordered.

10th. The Apothecary should always label and number correctly all medicine dispensed by him on the prescription of a Physician; he should also, invariably, transcribe on the label in a plain legible handwriting, the name of the patient, the date of the prescription, the directions intended for the patient, and the name or the initials of the prescriber.

11th. The original prescription should always be retained by the Apothecary, whose warrantee it is in case of error on the part of the prescriber. When a copy is requested, if, as in many instances no objection can be urged, it should be a *fac-simile* in language and symbols, and not a translation.

12th. In no instance is an Apothecary justifiable in leaving his business in charge of boys or incompetent assistants, or in allowing such to compound prescriptions, excepting under his immediate and careful supervision.

13th. In justice to his sense of the proper limits of his vocation, to the medical profession, and to his customers, the Apothecary should abstain from prescribing for diseases, excepting in those emergencies which occasionally occur, demanding immediate action, or in those every-day unimportant cases where to refuse counsel would be construed as a confession of ignorance, calculated to injure the reputation

of the Apothecary, and would be attended with no advantage to either Physician or patient.

14th. The sale of quack or secret medicines, properly so called, constitutes a considerable item in the business of some apothecaries. Many of the people are favourably impressed towards that class of medicines, and naturally go to their Apothecaries for them. It is this which has caused many Apothecaries to keep certain of these nostrums, who are ready and willing to relinquish the traffic in them, but for the offence that a refusal to supply them to their customers would create. At present all that the best disposed Apothecary can be expected to do, is to refrain from the manufacture himself of quack and secret medicines; to abstain from recommending them, either verbally or by exhibiting show-bills announcing them for sale in his shop or windows, and to discourage their use when appealed to.

15th. Having in view the welfare of the community and the advancement of Pharmaceutical science and interest, it is all-important that the offices of prescribing and compounding medicines should be kept distinct in this city and surrounding districts. All connexion with or moneyed interest in Apothecary stores on the part of Physicians, should therefore be discountenanced. With respect to the pecuniary understanding said to exist in some instances between Apothecaries and Physicians, we hold, that no well-disposed Apothecary or Physician would be a party to such a contract, and consider the code of Ethics of the College of Pharmacy and the Constitution of the Philadelphia County Medical Society as sufficiently explicit on this subject.

16th. In reference to the patronage on the part of Physicians of particular Apothecaries, we are of the opinion, as a general rule, that Graduates in Pharmacy should be encouraged in preference to others of the same date of business; and whilst admitting the abstract right of the Physician to send his prescription where he pleases, we think that justice should dictate the propriety of his encouraging the nearest Apothecary deserving of his confidence and that of the patient.

Committee of County Medical Society.—D. Francis, Condie, Wm. Maybury, G. Emerson.

Committee of Philadelphia College of Pharmacy.—William Procter, Jun., H. C. Blair, John H. Ecky.—*American Journal of Pharmacy.*

PHARMACEUTICAL CONVENTION TO MEET IN PHILADELPHIA, OCT. 6, 1852.

(By the Editor of the *American Journal of Pharmacy.*)

THE following is a circular letter addressed by President Guthrie to the Pharmacutists of the United States, on behalf of the late Pharmaceutical Convention:—

“NATIONAL PHARMACEUTICAL CONVENTION.

“Circular Letter.

“New York, November 25, 1851.

“Sir,—At a Meeting of Delegates from the Colleges of Pharmacy of the United States, held in this city, on the 15th of October, 1851, the following Preamble and Resolutions, explanatory of themselves, were offered, and, after a free and full discussion, unanimously adopted:—

“Whereas, the advancement of the true interest of the great body of Pharmaceutical Practitioners, in all sections of our country, is a subject worthy of earnest consideration; and whereas, Pharmacutists, in their intercourse among themselves, with Physicians, and the public, should be governed by a code of ethics calculated to elevate the standard and improve the practice of their art; and whereas, the means of a regular Pharmaceutical education should be offered to the rising Pharmacutists by the establishment of Schools of Pharmacy, in suitable locations; and whereas, it is greatly to be desired that the united action of the profession should be directed to the accomplishment of these objects; therefore,

“Resolved, That, in the opinion of this Convention, much good will result from a more extended intercourse between the Pharmacutists of the several sections of the Union, by which their customs and practice may be assimilated; that Pharmacutists would promote their individual interests and advance their professional standing by forming Associations for mutual protection, and for the education of their Assistants, when such Associations have become sufficiently matured; and that, in view of these important ends, it is further

“Resolved, That a Convention be called, consisting of three delegates each, from

incorporated and unincorporated Pharmaceutical Societies, to meet at Philadelphia on the first Wednesday in October, 1852, when all the important questions, bearing on the profession, may be considered, and measures adopted for the organization of a National Association, to meet every year.

"The objects set forth in the above, I trust, will meet the hearty approbation of yourself and the Apothecaries of your place, and lead to the formation (if not already in existence) of such an Association as will co-operate in the furtherance of the proposed Association.

"Our medical brethren have, as you doubtless are aware, an organization similar in character, holding its sessions annually, in which all matters pertaining to their profession are fully discussed,—the beneficial effects of which are already apparent, though the Association has been in existence but a few years.

"They cannot give to the subject of Pharmacy the attention it requires and deserves, neither is it a matter legitimately falling under their cognizance, but belongs to Pharmaceutists themselves.

"The medical profession and the community at large rightfully look to us for the correction of any existing abuses, the advancement of the science, and the elevation of the business of an Apothecary, to the dignity and standing of a profession.

"To this end we invite you to the formation of such Associations, in view of the Convention, to be held in Philadelphia, on the first Wednesday of October, 1852.

"Communications, intended for said Convention, may be addressed to William Procter, jun., Philadelphia; George D. Coggeshall, New York; or S. M. Colcord, Boston.

"Any communication, touching the subject of the above letter, will be cheerfully responded to by the President of the Convention.

"C. B. GUTHRIE,
"President Convention Colleges of Pharmacy."

When the invitation to the Convention from which the above resolutions emanate was received by the Philadelphia College of Pharmacy, several of the members expressed the opinion, that although the call was for a special object, the Convention might take a wider range in its influence, and form a *point d'appui* from which the Pharmaceutical profession of the whole country might be reached, and a course of action instituted, which eventually would revolutionize the condition of Pharmacy in the United States. The most sanguine hopes of these members were gratified by the unanimous adoption of the above preamble and resolutions by the Convention.

We feel a lively faith that ultimate and lasting good will result from this movement. We cannot repress the expression of a deep gratification at the prospects which open out in the future favourable to the real progress and elevation of our profession, both in its practical and scientific relations, over our favoured country, wherever the Apothecary has located or is locating. It will necessarily be a work of time, and calls for the faith, the energy, and the untiring perseverance of its supporters. But is not the object worthy of its advocates and their best exertions? That object is no less than a complete organization of the large, but to a great extent, ill-educated body of Pharmaceutists of the United States, which will induce the existing members to pursue an efficient course of *self-education*, and dispose them to extend to their *protégés* and Assistants a more liberal tuition in the sciences accessory to our art.

Perhaps in no country in the world is the proportion of Apothecaries to population greater than in our own. In no country is their practice so little interfered with by legislative enactments or so little fostered by the government. Left to themselves to pursue what course they may choose, it is only when some of them by ignorance or carelessness have harmed the community, that common law steps in and deals with them as with other offenders against the well-being of society; whilst no legal inducement is held forth for their improvement or encouragement.

In view of these facts what a noble field is open for Pharmaceutical reform! A strong interest has already been awakened far and wide; from many a distant city and secluded town has the voice of inquiry gone forth seeking for the means of self-improvement; and whether this interest arises from pecuniary or higher motives, it indicates that the blossoming time is approaching; that the fruit yet in embryo will soon be forming, and that on wise treatment and careful culture will depend the abundance and the quality of the harvest.

We would then, with all the earnestness of our nature, invite the serious attention of our brethren, everywhere, to the Resolutions of the Convention; we ask them to

throw aside local jealousies and sectional feelings, and as the basis of a national Pharmaceutical reform, to found local societies for mutual improvement. Let every town and every city have its society. It is in these and *by* these that real good is to be promoted, for charity begins at home. *They* are, in fact, the only sure foundation upon which to base a state or national association; for however eloquent and persuasive the language of Conventions, when addressed to individuals, and however wise and useful the precepts they inculcate,—like the seeds sown by the husbandman they will perish or yield but a scanty and impoverished return, if the soil of local influence and interest be not prepared for their reception at the outset, and carefully tended by the hand of culture during progress in germination, growth, and fruition.

Fewness of numbers should not deter Pharmacæutists from associating. A dozen well-disposed men can accomplish wonders when enlisted in a common cause, and animated by a single interest. The Pharmaceutical Society of Great Britain, now numbering about 2500 members in all parts of England, and in Scotland, had its birth at a tea-party given in London by a Chemist and Druggist. A small number may not be adequate to establish a school, or desire to seek an act of incorporation, but if not sufficiently numerous or advanced to teach others, they are sufficiently so to learn themselves. And how, it may be asked, can it be done? We answer, by adopting a constitution and by-laws; by establishing monthly or more frequent meetings for inquiry and discussion on subjects appertaining to their business, or concerning their future advancement; by adopting a code of ethics regulating the intercourse and conduct of the members in their professional relations; and, finally, by subscribing to scientific journals and standard works for circulation among themselves, so as to form the nucleus of a library. Every Association of this kind is entitled to send three representatives to the Convention of 1852; for the far-seeing language of the resolution is “from incorporated and *unincorporated* Pharmaceutical Societies.”

As a member of the committee for receiving, collecting, and communicating information and suggestions bearing on the Convention, we will cheerfully communicate with parties desiring information, or who may wish to have their views thrown before the Convention when it meets.

In regard to the utility of the proposed Convention itself we have no fears, provided it is based on a wide-spread representation—provided it is composed of earnest and sensible men, who aim at the *possible*, and fear not to grapple with that which keeps them from its possession. Before the continued voice of such a gathering, quackery, whether *professional* or *vulgar*, would quail—would shrink into the hands of men quackish by nature,—and the profession, washed of its contamination, could with clean hands and clear accents raise their voices against it with an effect, on all but the hopelessly ignorant, that would cripple the most fruitful sources of its present success.

SALE OF NEES VON ESENBECK'S LIBRARY AND HERBARIUM.

PROFESSOR NEES VON ESENBECK has lately published a catalogue of his Library, from the preface of which the following is an extract:—“I am,” says the author, “without property: my Library and my Herbarium are all I possess, all I am able to leave to my family. In my career as a medical man, I have always considered the interests of the suffering poor as of primary, my own of secondary importance; and, being devoted to scientific pursuits, I did not obtain a lucrative, certainly never an extensive, practice. A small estate, inherited from a relation, afforded for some years the means and leisure for cultivating science successfully; but, during the French wars, my property became untenable, and I was induced to accept a Professorship at Erlangen and the Presidency of the Imperial Academy of Naturalists. Having exchanged Erlangen for Bonn, and thus settled in Prussia, it became a question whether the Academy should have its seat in Bavaria, because my predecessor resided in Erlangen when the German Empire was dissolved, or whether it should retain its position as a national institution for the whole of Germany. The negotiations which followed ended by the Academy retaining its independence, and, as far as circumstances would permit, its position in regard to the Confederation. By my exertions the institution obtained a confirmation of its old statutes, and, during its stay in Prussia, an annual grant of 1,200 thalers. Since 1818 I have constantly laboured in restoring this ancient institution, and discharging my duties

as professor in the University; indeed, my academical duties required my whole attention, and prevented me from accepting any of the more lucrative places which from time to time became vacant. Thus it happens that, since Government has deprived me of the Professorship, my circumstances are such as compel me to part with my Library and Herbarium. Having no prospect of a pension, and no desire to solicit favours in high places, I address myself to the Members of the Academy and to my friends and contemporaries, requesting their aid in trying to dispose of my collections. If my Library and Herbarium could be sold as a whole, I should be able to realize their value, and should consider the amount as an acknowledgment of thirty years of academical services. The Herbarium consists of 297 volumes in folio and 42 volumes in quarto, and contains 80,000 sheets. It is valuable on account of its consisting chiefly of exotic specimens, including plants collected by Sieber, Preiss, Wallich, Wight, Ecklon, Zeyher, Drège, Pappe, Wied, and others, and representing most fully the Floras of Mexico, New Holland, North America, Brazil, Southern Africa, the East Indies, and Europe. It is rendered still more important by its containing the original specimens, on which my monographic labours, the dissertations on the *Laurineæ*, *Solaneæ*, *Acanthaceæ*, *Hepaticæ*, *Asteraceæ*, *Cyperaceæ*, *Gramineæ*, and *Restiaceæ*, are founded. The Library is composed of 3,000 volumes, embracing the standard works on Natural History and Natural Philosophy. It is to be sold in Breslau on the 1st of May, 1852, by public auction, and commissions will be received by the Schletter'sche Buchhandlung in Breslau, or any other great bookseller on the Continent.

"The Herbarium, if it cannot be sold entire, is to be disposed of in sets. It has been valued at 12,000 thalers;—the *Laurineæ* at 280 thalers, the *Acanthaceæ* at 600, and the *Glumaceæ* at 3,000."

Since the appearance of the above letter, we learn with satisfaction that Professor Nees von Esenbeck has been requested to continue as President of the Academy *Naturæ Curiosorum* by his adjuncts, in whom the nomination exclusively rests; and that he has assented. This mark of respect towards one of the most distinguished and classical botanists of our age, who during a long series of years has contributed vastly to the celebrity of the Academy, will be hailed, not only by its own members, but by every lover of Natural Science.

Dr. Lehmann, of Hamburg, writes on this subject as follows:—"When Nees tendered his resignation of the Presidentship of the Acad. Nat. Curiosor., he summoned his *adjuncts* to meet at Schweinfurt (the birthplace of the Academy), in order to exercise the right inherent in their appointment, to nominate a successor; and likewise to arrange for the due celebration in 1852 of the two hundredth anniversary of the Academy. In order to 'frustrate the many intrigues that are at work,' it had been resolved beforehand, at a meeting at Erlangen, that Nees should be requested to continue President, and at the same time to form, if possible, a union between the Academy and the Annual Association of Naturalists; further, that the adjuncts had nothing whatever to do with the affair between the *Prussian Professor* and the *Prussian Minister of Public Instruction and Church Affairs*. This resolution was unanimous at Erlangen, and at Schweinfurt it was carried without difficulty. Nees consented to the proposed arrangement; and Lehmann and Jäger, high in medical practice in Stuttgart, were desired to take the needful steps on the occasion, including a proposition to secure to the Academy greater independence from all government influence or control. The two hundred years' jubilee, which happens on the 8th of January next, is to be celebrated at Wiesbaden on the 18th of Sept., at the meeting there of the Association of Naturalists. Our friend is writing a programme to that effect. At Berlin, where he was deputed to gain the concurrence of Humboldt, he was most successful: the latter promised his best exertions."—*Hooker's Journal of Botany*.

THE USE OF ARSENIC FOR DRESSING SHEEP.

BY JAMES TUNSTALL, M.D.

I HAVE read with much interest, the report of the trial of *Huggins v. Froome*, and highly approve of the judicious remarks made by you in reference to the case in the last number of the Journal. The principle involved in it is of the utmost consequence to every Pharmaceutical Chemist in the Kingdom; he,

indeed, will now be held responsible for the bad effects of every poisonous compound, which, although in many instances used without fatal effects, may involve him in serious legal expenses, if his directions are not fully complied with.

I have, as the Members of your Society know, paid considerable attention to this subject, and am in a position to prove from the correspondence I had with many of the provincial Pharmaceutical Chemists, prior to the passing of the Arsenic Act, that that destructive drug only retains its place in sheep-dipping compositions because the farmers have a rooted prejudice against the use of any other ingredient.

While I regret that the verdict should have been given against Mr. Froome, I sincerely hope that it will put the farmer on his guard in reference to the dangerous character of arsenical dippings, not only to the sheep themselves, but to those who partake of their flesh.

It is really absurd that we should be told, in the middle of the nineteenth century, that arsenic alone is capable of destroying tick in sheep. What would be thought of the farmer who asked for arsenic to destroy vermin in the human head?—yet the cases are exactly parallel.

Out of evil great good sometimes arises; *caveat emptor* no longer applies, so that I would fain hope that this decision will have the effect of altogether banishing the use of arsenic in sheep-dipping compositions. Surely there are many drugs which might be safely substituted for it: sulphur and potass combined with tar or soft soap would answer every purpose.

Let every Member of your Society resolutely refuse to dispense any prescription in veterinary medicine containing a sufficient quantity of arsenic, which, when applied to an abraded surface, may prove destructive to animal life, unless the party requiring it indemnifies him from any consequences which may ensue.

Bath, January 15th, 1852.

CONVICTION UNDER THE "SALE OF ARSENIC PREVENTION" ACT.

MR. WHITE, Druggist of Thurlow, has been convicted in the penalty of £5 for selling arsenic without complying with the forms of the Act. The prosecution arose out of the recent commitment for murder by poisoning in the above village.—*Essex Standard*.

ROYAL INSTITUTION.

PROFESSOR FARADAY opened the Friday evening meetings at the Royal Institution on the 23rd of January with a description of his recent contributions to the science of magnetism. The subject was a new application of a previously known principle, for detecting and measuring the power of the magnetism of bodies. He first described the methods now usually adopted for determining these points, by the use of magnets of known power, or of bars of soft iron capable of undergoing magnetic induction; and explained the law which has been deduced from the observations made in this way, namely, that the force is inversely as the squares of the distances. He stated, however, that the law had not been fully verified by experiment for very small distances. The method of measuring the magnetic force which Professor Faraday recommends is founded upon the well-known fact, that when a conductor of electricity is moved in such a direction as to cut the lines of magnetic force, a current of electricity is determined in the conductor. This current of electricity is indicated by a galvanometer. Thus, in order to measure magnetic forces, a wire connected with a galvanometer is made to cut the lines of force, and the deflection of the galvanometer needle is observed, the force being calculated from the extent of deflection. The current of electricity thus produced being of very low tension, it is necessary to use a galvanometer having only four or five coils of thick wire, instead of the numerous coils of fine wire usually employed in constructing the most delicate galvanometers.

NOTICES OF BOOKS.

THE LONDON AND PROVINCIAL MEDICAL DIRECTORY.—JOHN CHURCHILL. This work improves every year. The first edition, 1845, was confined to London and contained 180 pages; it has now increased to 670. It also contains a Continental Medical Directory, and much useful information respecting medical institutions, &c. THOMSON'S CONSPICUUS OF THE PHARMACOPŒIAS. Sixteenth edition. By E. L. BIRKETT, M.D. 12mo. pp. 216. LONGMAN.

DR. RANKING'S ABSTRACT OF THE MEDICAL SCIENCES, vol. xlv., p. 395.—CHURCHILL.

DICTIONARY OF DOMESTIC MEDICINE AND HOUSEHOLD SURGERY. Part i., p. 45. To be completed in twelve monthly parts.—GROOMBRIDGE, Paternoster Row.

TO CORRESPONDENTS.

WE have the authority of Baron Liebig for stating (in reply to several correspondents) that the article "On the Nature, Import, History, and Literature of Pharmacy," recently published in a new monthly journal, was not written by him. It forms the introduction to the *Handbuch der Pharmacie*, by the late Professor Geiger; the last edition of which, published in 1843, was edited, after the author's death, by Baron Liebig, for the benefit of the widow and children of his deceased friend. This explains why Liebig's name occurs along with that of the author, on the title-page of the last edition. But the article itself makes a part of the previous editions. We have seen it in the third edition of Geiger's *Handbuch*, published in 1830, thirteen years before the name of Liebig was connected with the work.

We have received from Dr. G. C. Wittstein, of Anspach, the first number of his "*Vierteljahresschrift für praktische Pharmacie*," (*Quarterly Journal of Practical Pharmacy*), with a proposal to exchange Journals. We accept the offer, and the future numbers of this Journal will be sent through Messrs. Williams and Norgate.

H. J. B. (Fleet Street).—(1.) We are not acquainted with a recognised formula for bismuth ointment. An ointment composed of one drachm of nitrate of bismuth and half an ounce of spermaceti ointment is sometimes employed.—(See *Dr. Pereira's Mat. Med.*, vol. i., p. 708.)—(2.) The wholesale Druggists who export medicines to Australia would be the most likely parties to furnish the information.

C. S. T. (London) is mistaken in supposing that the observations were intended to apply to him. His letter was handed to the gentleman to whom it refers, and we regret that we accidentally omitted to acknowledge it.

Ajar.—The instructions are quite correct.

E. Y. (New Cross).—Dr. Pereira's work on Food and Diet.

A. M. (Dublin) will observe, that we have adopted his suggestion.

E. B. Y. (Ledbury).—(1.) There is no authorised formula for tincture of Sumbul. We have made it in the proportion of 2 oz. of Sumbul to a pint of proof spirit.—(2.) See vol. vi., p. 13.

C. L. M.—We cannot answer the question.

Æsculapius (Spalding) will find the formula for cement, page 372.

A Subscriber (Wednesbury) should write to the secretary. See vol. vii., No. vii.

C. M. C. (Dundee).—We regret the error. It should have been, vol. vii., No. vii.

P. S. (Kingston).—See vol. viii., p. 596.

We have received a letter with the following memorandum outside:—"Received in a note addressed to the postmaster of Bristol, anonymously, from London.—J. R."

We have also received a notice of the "Chemists and Druggists Guardian Society," Salford, a prospectus of the *Journal of Physical Regeneration*, and a report respecting the quarantine laws.

A Country Druggist.—The Sale of Arsenic Prevention Act contains no allusion to any other poison.

J. L. B. L.—The lecture is published by the Society of Arts. Most of the substance of it has appeared in various parts of this Journal, in the reports of the Great Exhibition.

F. D. C.—Should write to the Secretary.

* * The Answers to several Correspondents are unavoidably postponed.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, Secretary, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho. Other communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. IX.—MARCH 1st, 1852.

PROGRESS OF THE PHARMACY BILL.

THE rumour to which we referred last month, respecting an early dissolution of Parliament having subsided, and the House having resumed its regular business, the Pharmacy Bill was brought forward in due course, as reported in another part of this number.

Some amendments having been introduced into the Bill to meet objections which had been advanced, it was thought advisable to bring in the amended Bill, which might, if necessary, be referred to a committee, instead of moving for a committee in the first instance, to consider the entire subject, as suggested at the time the Bill of last session was withdrawn. If it should be found that the grounds of objection are removed, the necessity for a committee would be superseded, and from communications received from several quarters, we have reason to hope that this will be the case.

The Royal Colleges of Physicians and Surgeons of London have always been favourable to the introduction of a measure for regulating the qualifications of Pharmaceutical Chemists; and among the petitions presented to the House last session, were the names of the Presidents of those bodies, and many of the most influential Fellows and Members. The disposition to support the Bill on the present occasion appears to be unabated.

The Master and Wardens of the Society of Apothecaries have communicated, through Mr. Upton, a strong objection to the word Toxicology in the Bill. They consider this term to comprise the medical treatment of cases of poisoning, which is out of the province of the Pharmaceutical Chemist. This subject was brought under the notice of the Council last year, and it was resolved that the word should be erased in the event of its proving a serious ground of objection. It was not intended to comprise more than a knowledge of the Chemical nature of poisons, with which every Chemist ought to be familiar, and which is in fact included under the general term Chemistry. It has, therefore, been agreed that the word Toxicology shall be erased in committee, which removes the only objection raised by the Master and Wardens of the Apothecaries' Company against the Bill.

The establishment of a Board of Examiners in Scotland has been the means of enlisting in the cause many warm supporters, who previously viewed the proceedings with comparative indifference, if not distrust.

The College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, opposed the Bill of last session under an impression that it would interfere with the rights and privileges vested in those bodies. Some amendments were introduced, and one clause was expunged last year for the purpose of meeting this opposition, and confining the operation of the Bill to Pharmaceutical Chemists. It is not intended by the Bill to prejudice or in any way to affect the members of the Medical profession, and in order to remove all doubt upon the subject some trifling verbal amendments have now been made which we trust will prove satisfactory.

The definition clause is amended as follows :—

“The term Pharmaceutical Chemist, used in this Act, shall be construed to include Chemist and Druggist, Dispensing Chemist, and every other term denoting a dispenser of medical prescriptions and vender of medicines, not being a member of the Medical profession, or practising under a diploma or licence of a Medical or Surgical Corporate Body.”

In the third clause, which relates to voting by proxy, it is proposed to add a proviso, that no member shall hold more than ten proxies at any meeting,—also

to limit such voting to the *election of officers*; as absent members could not be competent to vote upon *propositions* which might be discussed at general meetings, and on which a correct opinion could only be formed by hearing the arguments.

It will also be necessary to limit or define the fees payable on examination.

There are still some other matters of detail which will require consideration in Committee, and on that occasion further amendments, if necessary or expedient, may be introduced.

While adverting to the several modifications which it has been considered expedient to adopt for the reasons assigned, we may anticipate the enquiry on the part of some of our readers, whether the Bill thus altered will be sufficiently stringent to answer the purpose intended? We are quite prepared to answer this question.

The Bill in its present form will be a very important step in advance. It may not satisfy those who desire a monopoly, similar to that which exists in some nations in Europe, where the practice of Pharmacy is fettered by rigid restrictions, where the number of *Pharmaciens* is limited, and no unlicensed person is permitted to prepare a prescription or sell a dose of a powerful drug. But it will recognize and place on a proper footing a class of regularly educated Pharmaceutical Chemists, who will no longer be ranked as they now are, with the huckster and general dealer. The necessary exemption of those already connected with the business, will occasion some delay in the accomplishment of the results, but in the course of a few years the influence of the improved system will be manifest.

From opinions which have been expressed in the House of Commons, and in other influential quarters, we are quite convinced that it would be impossible to carry a measure of that stringent nature which some of our readers desire; that the Bill now in contemplation is as much as we can reasonably expect; and that we shall be more likely to succeed by restricting our claims within due limits, than by claiming restrictions which might be used as a lever for throwing out the Bill.

Petitions in favour of the Bill are coming in from all quarters, and many Members of the House have promised to give it their support. Unfortunately, an unexpected event has thrown the business of the country into a state of temporary confusion, and the Pharmacy Bill, as well as other legislative measures, must wait the result of the change of Ministry, and the arrangements contingent upon this crisis.

We again repeat that we are not at all discouraged. The cause is evidently progressing, and must sooner or later prevail. It is only a question of time; and although the delay may try our patience it will not damage the result, if we all continue to be unanimous and firm.

Any Petitions which may be in hand or in process of signature, should be reserved until the day is fixed for the second reading of the Bill, of which due notice will be given.

We have not reprinted the Bill in this number, as it is essentially the same as the Bill contained in our number for August, 1851 (vol. xi., p. 61), with the alterations above specified, and a few others, too trifling to mention. The Bill may be obtained at Great Turnstile, Holborn.

PHARMACY IN FRANCE.

THE *Pharmaciens* in France are much in advance of the Pharmaceutical Chemists of this country, in their education and social position. Their regular organization as an educated body, took place in the year 1803, and progressive improvements have subsequently been made in the regulations of the Schools of

Pharmacy, in the examinations, and in the laws relating to the practice of Pharmacy. The Pharmaciens are completely isolated from the medical profession on one side, and from the grocers on the other. They have acquired an independent position, and a scientific character. Yet much remains to be done. Experience has pointed out certain defects in the existing laws, and suggested amendments. Many efforts have been made to pass a new Pharmacy Bill, but hitherto this measure although several times brought forward, has always, like the waters of Tantalus, eluded the grasp of its supporters, just at the moment that they thought the object was secured.

THE SUPPLY OF MEDICINES TO MERCHANT AND EMIGRANT VESSELS.

If it be necessary that vessels on long voyages should be provided with a medical officer, it is equally necessary that the medical officer should have at command a supply of medicines fit for use.

Our attention was directed to this subject in consequence of the regulations of Her Majesty's Land and Emigration Commissioners, to which we referred in our last number. Subsequent investigation has led to the conviction that the Commissioners had stronger grounds for the course they have adopted than we at first believed to exist. At the same time we think a system of inspection might be adopted which would afford the requisite protection to emigrants and sailors generally, without resorting to an interference with fair and legitimate free trade.

A deputation of Chemists waited on Her Majesty's Land and Emigration Commissioners on the 14th February, for the purpose of offering some suggestions on the subject and enquiring whether any modification of the regulations could be entertained. The deputation were courteously received, and the question was discussed without reserve on both sides. There were on the table at the time complaints which had just been received from vessels in which the medicines had been found to be unfit for use, or very inferior in quality, and the Commissioners stated that, under existing circumstances, they did not feel justified in departing from their present plan. It would not answer their purpose, for the number of vessels chartered by them, to employ professional inspectors to examine minutely all the medicines furnished, and they doubted the efficacy of such inspection in the manner which it is usually conducted.

The deputation could not dispute the grounds upon which this decision was founded, but at the same time suggested that a system of inspection might possibly be instituted for merchant and emigrant vessels generally, which would be found satisfactory. The Commissioners said their attention was confined exclusively to vessels chartered by them, and that other vessels being under different control, they could not interfere respecting them.

Judging from this and other information received, that considerable laxity prevails in the supply of medicines to merchant and emigrant vessels not thus protected, we have made further enquiries, the result of which confirms this impression. Some of our correspondents have given us reports of their experience on occasions when the most simple and ordinary remedies were not to be had, and those in hand were scarcely fit for use.

The reply of the President of the Board of Trade to a question on this subject (page 430), shows the necessity for further investigation. It is a great hardship for sailors and others when overtaken with illness during a long voyage, to be destitute of such means of relief as common prudence would have suggested; and it is quite as absurd to appoint a medical officer to attend a ship's crew without an efficient supply of medicines, as it would be to send a regiment of soldiers to battle without powder and shot.

INFORMATIONS UNDER THE MEDICINE STAMP ACTS.

We regret to announce another "epidemic" of writs under these Acts. The locality of this visitation is Manchester, and the exciting cause is the sale of "Camphor ball for chapped hands, roughness of the skin," &c.

This preparation comes rather more under the class of cosmetics than medicinal compounds, and we stated in our number for Feb., 1848, that we had "never heard of any writs for selling articles of the above description without a stamp." At the same time we pointed out the existence of a doubt as to the liability, and avoided expressing a positive opinion.

In Jan., 1850, we gave examples showing the difficulty of defining the boundary line between exemption and liability, and the consequent danger of "sailing too near the wind." It appears that notwithstanding the numerous explanations which have been given, and appeals which have been made to the authorities at Somerset House, fresh doubts continue to arise from time to time, and we fear this will be the case so long as the present Acts remain in force.

The sale of a pot of cold cream or a camphor ball is in itself a matter of small importance, but when we see writs issued against twenty or thirty Chemists, not one of whom was conscious of any violation of the law, this is a serious source of annoyance. A man whose character has hitherto been without reproach finds himself suddenly impeached on a charge of fraud. On conferring with his neighbours he finds that many of them are in a similar predicament. He appeals for redress, declaring his innocence of any intentional violation of the law, and the penalty is mitigated from £10 to 10s. This, however, is not the end of the affair. In the event of a similar oversight, equally unintentional, occurring at a future time, his "first offence" is recorded against him, and he may expect to pay a more heavy penalty.

We have now to explain the ground upon which the camphor ball writs were issued, and the mode in which the liability may be avoided. This depends on the words used on the label. If the label contain the words camphor ball "for chapped hands, roughness of the skin," &c. This is held to be a recommendation for the cure or relief of a disease or a disorder, namely, chaps or roughness of the skin. If the following were substituted—"for softening and preserving the skin," the same meaning would be implied but no stamp would be required, because no disease or disorder is mentioned.

There is another view of this subject which is worthy of notice. A Chemist introduces a preparation for domestic use without any disguise or secrecy respecting its composition. He mentions on the label the purposes to which the preparation is applicable, and affixes a stamp. A demand arising, other Chemists offer for sale the same preparation, omitting certain words on the label, and affixing no stamp. The originator of the preparation, who complies with the strict letter of the law, finds himself undersold, and his customers decoyed away by those who adopt a label to all intents and purposes identical in effect, but so worded as to evade the stamp duty.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

CONVERSAZIONE.

THE CONVERSAZIONE, to which the President, Vice-President, and Council, had invited many Medical and Scientific men to meet the Members and Associates of the Society, was held on Wednesday, the 11th of February, when the rooms usually occupied for the purpose were well supplied, through the kindness of contributors, with objects of general or scientific interest, and well filled throughout the evening with an animated assembly.

Messrs. Coffey and Smith exhibited their steam apparatus for Pharmaceutical purposes in full operation. This was, indeed, the most attractive object present, and ample opportunity was afforded for testing the practical working of the apparatus, and for criticising the different arrangements which Mr. Coffey has so ingeniously combined in a small compass. Some parts of the apparatus exhibited have been recently added, among which we may mention a contrivance, which was much admired, for stirring extracts and other liquids during the process of evaporation, a water-bath tunnel for filtering fatty or other substances requiring the application of heat to keep them liquid, a steam-saucepan for making decoctions, &c., and a vacuum pan which is worked with a solid-pistoned pump. Mr. Coffey has also recently constructed a gas furnace for heating crucibles of large size. Several gentlemen who were present, and are using Mr. Coffey's apparatus, expressed themselves perfectly satisfied with it.

Passing from this strictly Pharmaceutical subject to one of more general interest, we may notice Mr. Shepherd's electro-magnetic clock, which was exhibited by the inventor and patentee. In this instrument electricity is the motive power which is substituted for the spring or weight of ordinary clocks, and it is said, with advantage in regard to the regularity of the action. But this is not the only advantage claimed in the application of electricity to time-pieces. Having one good time-keeper, by connecting this by means of wires with any number of dials the same time will be indicated by all.

Some very powerful and beautifully finished steel magnets, made by M. Loge-meat, of Haarlem, were exhibited by Mr. Knight, of Foster Lane, the London agent. The first of these magnets shown in this country was exhibited some time ago by Mr. Faraday, at the Royal Institution, when he represented its power as nearly double that usually possessed by magnets of the same size. One of the magnets exhibited on the present occasion was capable of supporting nearly three hundred-weight attached to the keeper.

Three very important improvements in the manufacture of flax and cotton were illustrated by a large number of specimens which covered one of the long tables in the lecture-room. The processes referred to are those respectively of the Chevalier Claussen, of Mr. Bower, and of Mr. Mercer. The old mode of preparing the flax for the use of the manufacturer consists in "retting" the straw, that is, steeping it in water until decomposition of some of its constituents has been effected. Not only is this process objectionable on account of the offensive odour produced, but it is liable to frequent failure from circumstances over which the operator has but imperfect controul.

Claussen's process consists in steeping the flax-straw in a weak solution of caustic alkali to fit it for the first preparation to which it is submitted, instead of leaving it to undergo spontaneous fermentation in water.

Bower, on the other hand, steeps the flax-straw in a weak solution of sulphate of soda, which he finds produces the same effect as fermentation or caustic alkali. In some cases after thus soaking the flax he puts it into a vessel from which the air is exhausted, and in this process the fibres are separated from each other.

Claussen has, also, what is said to be a most efficient process for separating the fibres of the flax and giving to it the characters of cotton. This process consists in destroying the cylindrical or tubular character of the fibre, by means of carbonic or other gas, the action of which splits the tubes into a number of ribbon-like filaments, solid in character and of a gravity less than cotton, the upper and under surfaces of which are segments of circles, and the sides of which are ragged and serrated. In order to explain the nature of the process by which this change is effected, it is necessary, first, to explain the structure of the flax plant. The stem of the plant consists of three parts; the shove or wood, the pure fibre, and the gum resin or glutinous matter which causes the fibres to adhere together. In the preparation of the plant for any purpose of fine manufacture, it is necessary first to separate from the pure fibre both the woody part and the glutinous substance. The former of these may be removed by mechanical means, previously referred to, almost as simple as those employed in the threshing of wheat. In order, however, to remove the glutinous substance from the fibre, recourse must be had either to the fermentation produced in the steeping process or to some other chemical agent. The present system of steeping in water, whether cold or hot, is, however, ineffectual for the complete removal of the glutinous substances adhering to the fibres, a large percentage of which is insoluble in water. The first process, therefore, which is necessary to adopt in the preparation of flax cotton, is to obtain a perfect and complete disintegration of the fibres from each other, by the entire removal of the substance which binds them together.

This is effected by boiling the flax for about three hours, either in the state in which it comes from the field, or in a partially cleaned condition, in water containing about one half per cent. of caustic soda. After undergoing this process, the flax is placed in water, slightly acidulated with sulphuric acid; the proportions of acid used being 1 to 500 of water. Any objections urged against the employment of such substances, even in the small proportions above-stated, are at once met by the fact, that the soda present in the straw, after the first process, neutralizes the whole of the acid, and forms a neutral salt, sulphate of soda. This process producing, as it does, a complete separation of the integral fibres from each other, is equally adapted for the preparation of long fibre for the linen, or of short fibre for the other branches of textile manufacture. When required to be prepared for linen, all that is necessary after the above process, is to dry and scutch it in the ordinary modes. The advantages which this mode of preparation possesses over any other mode in use, are stated in the official report of the proceedings at the Royal Agricultural Society to be the following:—

1. "That the preparation of long fibre for scutching is effected in less than one day, and is always uniform in strength, and entirely free from colour, much facilitating the after-process of bleaching, either in yarns or in cloth.
2. "That it can be also bleached in the straw at very little additional expense of time or money.
3. "That the former tedious and uncertain modes of steeping are superseded by one perfectly certain with ordinary care.
4. "That in consequence of a more complete severance of the fibres from each other, and also from the bark and boon, the process of scutching is effected with half the labour usually employed."

Complete, however, as may be the separation produced by this mode of treatment, the fibres, from their tubular and cylindrical character, are still adapted only for the linen or present flax manufactures, as their comparatively harsh and elastic character unfits them for spinning on the ordinary cotton or woollen machinery. At this stage, therefore, it is that the most important part of the invention is brought into operation. The flax, either before or after undergoing the processes required for the severance of the fibres, is cut by a suitable machine into the required lengths, and saturated in a solution of sesqui-carbonate of soda or common soda a sufficient length of time to allow of the liquid entering into and permeating by capillary attraction every part of the small tubes. When

sufficiently saturated, the fibres are taken out, immersed in a solution of dilute sulphuric acid of the strength of about 1 part to 200 parts of water. The action of the acid on the soda contained in the tube, liberates the carbonic acid gas which it contains; the expansive power of which cause the fibres to split, and produces the result above described.

Mercer's process is applied to cotton, not in its raw but in its manufactured state. The cloth is immersed in a strong solution of caustic soda, and subsequently washed with water. It is found that the cloth shrinks considerably when submitted to this treatment, so that the fabric acquires a much finer texture; its strength is also increased, and it acquires the property of taking dyes much better than before. There were a great number of specimens on the table, for which the Council were indebted to Professor Graham, which illustrated the effects of the process in a very interesting manner. The contrast in some of the specimens between the effects of dyeing cloth before and after the application of Mercer's process was very striking. A further account of this process will be found at page 429.

The Patent Wire Type Machine, which was in active operation, also attracted much attention. It had been furnished for the occasion by Mr. J. R. Johnson, one of the Directors of the Company, and M. Poirer, the inventor. The object of the invention is to produce printing type from copper, brass, zinc, and other hard metals, the letters being formed by a die, instead of being cast in a mould, as is now done with the comparatively soft type metal. A flattened wire, of the form and diameter of the type, on being passed through the machine, is cut into the proper lengths, and the required letter stamped at one end; and this is done so rapidly as to render the process a very economical one. Independently of the greater hardness of the metal used, as compared with that heretofore employed, it acquires increased hardness from the compression to which it is subjected, and the durability of the type, from these causes, is estimated to be sixty times greater than that of ordinary cast type. The letters are also more accurately formed.

Among machines having a more directly pharmaceutical application, there was one from Dr. Downing, called the *Aneurysmicon*, for applying warm medicinal vapours; and a feeding-bottle, called the single-tubed *Biberon*, from Dr. Ogier Ward. In this latter instrument the air only enters as the liquid contents of the bottle are withdrawn, and hence it is not liable to leak. We must not omit to notice also Mr. Stephen Green's anti-corrosion pump, for pumping oil of vitriol and other acids and liquids which act powerfully on metals. The pump is made of the brown stone-ware which Mr. Green manufactures into so many forms applicable for chemical and pharmaceutical purposes. Besides the above-named pump, there were exhibited, on the present occasion, stills, condensers, evaporating-pans, spherically-stoppered jars, percolaters, tincture-jars, stop-cocks, &c., all made of the same material. The plan adopted in most of these cases of fitting the different parts of the apparatus together so as to form air-tight joints, by grinding spherical surfaces together, is particularly worthy of commendation.

Some large glass jars were exhibited by Messrs. Powell and Sons, of the Whitefriars' Glass Works, in which also a new mode of stoppering is adopted.

Among other objects present were:—

The newly invented instrument of Professor Wheatstone's, called the *Pseudoscope*, by which concave or sunken surfaces of objects viewed through it, acquired the appearance of being convex or raised. This instrument was sent by Messrs. Watkins and Hill.

A great number of *Stereoscopes* were distributed in different parts of the rooms, having been furnished by Mr. Claudet, whose beautiful *Daguerreotypes* were thus shown to great advantage.

There were also some excellent *Daguerreotypes* by Mr. Mayall, and Calotypes by Mr. Hanniman; and a Polarizing apparatus from Mr. Newman's, of Regent Street, exhibited by Mr. Murray.

Those who are interested in the revelations of the microscope, had the opportunity of using some of the best modern instruments, which had been supplied by Mr. Ross, Mr. Highley, Mr. Deane, and Mr. Varley. The last named gentleman, in addition to the amusement which, as usual, he afforded with his microscope, added another object of interest in an air-pump on a new principle, the production of his son.

A model in glass of the Koh-i-noor diamond, and some minerals from Mr. Tennant.

Several rare minerals, including a very fine crystal of the black tourmaline, and a specimen of *Orangite*, containing the newly discovered metal Donarium, from Mr. Samuel Highley, jun.

Models in glass, illustrating his system of crystallography, from Dr. Leesom.

A series of compounds resulting from the action of nitric acid on cotton and other allied bodies, from Dr. Gladstone.

Several specimens of finely crystallized salts, including bicarbonate of soda, bicarbonate of potash, acetate of zinc, and iodide of potassium, from Messrs. Huskisson and Co.

A specimen of *Petroleum*, from a pitch-well in the island of Zante, collected in 1819, by the late William Allen, from Mr. Daniel Hanbury.

Specimens of woods, cut and polished, from Mr. Bentley.

Some curious botanical specimens, from Mr. N. B. Ward.

The cotton plant, and a few others, from the Royal Botanical Gardens.

LIVERPOOL CHEMISTS' ASSOCIATION.

Pharmaceutical Meeting, 23rd Jan., 1852.

DR. BRETT delivered a second Lecture on "Iron and its Compounds." He exhibited specimens of all the Pharmacopœia preparations of iron, and described the characters of each, expressing an opinion that the sesquioxide of iron frequently met with was made by calcining the sulphate. He founded this opinion on the difficulty of dissolving the sesquioxide in question.

MR. ABRAHAM observed, that the sesquioxide he met with effervesced with acids, which would not be the case had it been exposed to the high heat necessary for decomposing sulphate of iron; and he thought there was not much inducement to mix it.

MR. EDWARDS said that if made according to the Pharmacopœia, it would dissolve with difficulty.

At a meeting held 6th February,

DR. INMAN read a paper on "The Natural History of Hair," illustrated by numerous drawings on a large scale.

He commenced by describing hair in the vegetable kingdom, and tracing it through a variety of forms to something analogous to the feather and to the scale. He then pointed out the different forms of insects' hairs, tracing them upwards in a similar manner. He then gave a description of the varieties of hair found in mammalia, entering minutely into the character of their scaly, fibrous, and medullary parts. He pointed out the distinction between cellular, fibrous, and woolly hairs, and the intention of the different forms. He then went minutely into the formation and growth of hair, the nature of the bulbs, and the construction of the follicles, and concluded by adverting to the physical qualities of hair and their uses to the animal.

MR. EDWARDS exhibited in operation one of the very handsome Æsculapian stills of Coffey and Smith. Also a balance of Berlin manufacture, for taking specific gravities.

QUINIDINE.

BY MR. ROBERT HOWARD.

THIS alkaloid, which gained a prize in the Great Exhibition, has scarcely yet attracted much attention. Some of the cheaper barks now largely imported from New Grenada contain so much of it that it is, perhaps, as well that it should be more studied. The *Cinchona cordifolia*, from that part of the continent, is particularly rich in it. It is, however, contained in larger or smaller quantities in the Bolivian and Peruvian barks—the *Cinchona Calisaya*, *Boliviana*, *rufinervis*, and especially *ovata*.

Referring your readers to a very able paper in your Journal *, I beg to add a few facts from my own observations.

The sulphate of quinidine, or β quinine as it is called by some (Van Heijningen and others), is so like the sulphate of quinine, that the eye or the taste can with difficulty distinguish them. It forms the same light fibrous crystallization, and occupies as large a bulk. It corresponds in appearance with the description given by Winckler, of "chinidine." (See *Pharm. Journ.* for April, 1845, vol. iv. p. 468.) He notices that it has "a remarkably white colour and a peculiarly faint lustre." Its most striking characteristic is its extreme solubility. Pure sulphate of quinine requires nearly thirty times its weight of boiling water for solution, whilst the sulphate of quinidine dissolves in four parts. On the other hand the pure alkaloid crystallizes readily out of proof spirit and out of ether, whilst quinine does not crystallize out of either. A very good test for the presence of cinchonine in sulphate of quinine is also capable of being applied to detect the presence of β quinine. On this point I would refer for very interesting details to a paper by M. Guibourt, in the *Journal de Pharmacie* for January in this year.

In your Journal of April, 1843, I gave a test for sulphate of quinine, to which I would again advert, because subsequent experience has proved it to be a tolerably easy, and at the same time exact means of ascertaining its purity. Put 100 grains in a Florence flask with five ounces of distilled water, heat this to brisk ebullition; the sulphate of quinine ought not to be entirely dissolved; add two ounces more water, and again heat it to ebullition; ought to make a perfectly clear solution. If this be allowed to cool for six hours, and the crystals carefully dried in the open air on blotting paper, they will be found to weigh about ninety grains, the mother-liquor may be evaporated and tested with ether, when any cinchonine or β quinine will be easily detected. On examining sulphate of quinine of commerce from several leading manufacturers, I have found all of them give, within a grain or two, the same result, and, in each, indications of β quinine, though to an unimportant extent.

The above quantity of water (seven ounces) readily dissolves 800 grains of sulphate of β quinine; and if 100 grains of this salt are dissolved in seven ounces of water, the crystals dried as above weigh only fifty-four grains, thus leaving forty-six grains in solution instead of about ten grains.

The medicinal effects of β quinine deserve investigation, the chemical constitution and the taste appear to indicate a great similarity if not identity.

* *Pharmaceutical Journal*, vol. ix., p. 322, January, 1850.

ON THE ADULTERATIONS OF SULPHATE OF QUININE, AND THE MEANS OF DETECTION.

MR. ZIMMER, manufacturer of sulphate of quinine in Frankfort-on-the-Maine, has published the following circular and paper to his Correspondents abroad:—

Frankfort-on-the-Maine, Feb. 6th. 1852.

You are, doubtless, aware that various and partly spurious kinds of sulphate of quinine have for some time past found their way into the market. The sub-

stance now frequently mixed with quinine is quinidine. But little positive is as yet known of the medicinal properties of this alkaloid, and whatever may be the result of future experiments, its arbitrary substitution is, under any circumstances, unwarrantable, and renders a fair and honest competition almost impossible.

The importance of the subject has induced me to address a few words to you, that I may submit a simple experiment by means of which the most usual adulterations of quinine may readily be detected.

I have the honour to be, with much respect, &c.

C. ZIMMER.

THE high price of the genuine Bolivian *Cinchona Calisaya*, through the monopoly of its export, has given occasion to imports, from other districts, of *Cinchonas*, the quality of which widely differs from that of the *Calisaya*, inasmuch as they contain principally quinidine. The lower prices of these barks, regardless of their different constituents, have brought them quickly into use in many manufactories of quinine, whereby a large quantity of quinine, containing quinidine, has got into the market, causing an undue depreciation in the price of quinine.

The existence of this third cinchona-alkaloid is now established beyond a doubt by ultimate analysis, by the peculiarity of its salts, and by important distinctive tests; and there can be no further question, that quinidine must, equally with cinchonine, be distinguished from quinine. The external characters of sulphate of quinidine differ from those of sulphate of quinine; it has a greater specific gravity and less flocculent crystallization. In dry warm air it parts with its water of crystallization, without deliquescing or losing its crystallized aspect; lastly, it is far more soluble than sulphate of quinine in cold water and in alcohol.

One of the distinctive properties of the three alkaloids in question, viz., their behaviour with ether—places in our hands a ready means of detecting the mixture of cinchonine and quinidine, with quinine. Schweitzer (*Lond. Med. Gazette*, vol. xxi., p. 175) has already employed ether for the detection of cinchonine with complete success, and his process has, with justice, been subsequently quoted in most manuals, as it answers its purpose completely: cinchonine is known to be entirely insoluble in ether, whatever may be the quantity of ether employed. The solubility of quinidine in ether, as compared with that of quinine, is but slight: ten grains of pure sulphate of quinine dissolve in sixty drops of ether, and twenty drops of spirit of ammonia, while only one grain of sulphate of quinidine is soluble in the same quantity of the fluid; and in proportion, quinine containing quinidine will always be less soluble than pure sulphate of quinine.

Guided by this fact I can recommend the following simple and very convenient process for the detection of quinidine and cinchonine:—

Ten grains of the salt to be examined is to be put into a strong test tube, furnished with a tight-fitting cork, to this are to be added ten drops of diluted sulphuric acid (one acid and five water) with fifteen drops of water, and a gentle heat applied to accelerate the solution. This having been effected, and the solution entirely cooled, sixty drops of officinal sulphuric ether with twenty drops of spirits of ammonia, must be added, and the whole well shaken while the top is closed by the thumb. The tube is then to be closely stopped and shaken gently from time to time, so that the bubbles of air may more readily enter the layer of ether.

If the salt examined be free from cinchonine and quinidine, or contain the latter in no greater proportion than ten per cent., it will be completely dissolved; while on the surface, where contact of the two layers of clear fluid takes place, the mechanical impurities only will be separated (in which respect the various sorts of commercial quinine differ). After some time longer the layer of ether becomes hard and gelatinous, after which no further observation is possible.

From the above statement respecting the solubility of quinidine in ether, it appears that the ten grains of the salt to be examined, may contain one grain of quinidine, and still a complete solution with ether and ammonia may follow; but in this case the quinidine will shortly begin to crystallize in the layer of ether. The last trace of quinidine may be yet more definitively detected by employing, instead of the ordinary ether, some ether previously saturated with quinidine, by which means all of the quinidine contained in the quinine must remain undissolved. It is particularly requisite in performing this last experiment to observe, after the shaking, whether all has dissolved, for owing to the great tendency of quinidine to crystallization, it may become again separated in a crystalline form, and be a source of error.

If more than a tenth of quinidine or cinchonine be present, there will be found an insoluble precipitate at the limits of the two layers of fluids. If this be quinidine, it will be dissolved on the addition of proportionately more ether, while cinchonine will be unaffected.

It is expressly to be remarked, that the necessity for testing sulphate of quinine in search of other fraudulent adulterations is not superseded by the above described process.

We have particularly to determine upon the absence of inorganic substances, which may be effected by subjecting to red heat on a platinum dish, or simply by solution in alcohol. Gypsum, chalk, magnesia, &c., will be left undissolved. Boracic acid will be dissolved by alcohol, but its green flame will indicate its presence in the alcoholic solution when ignited.

The absence of organic substances, such as salicine, sugar, stearic-acid, &c., may be inferred from the formation of a colourless solution with pure concentrated cold sulphuric acid: it is as well to leave the sulphuric acid to act for some hours.

The presence of sal-ammoniac may be detected by the addition of caustic potash to the suspected salt, when, if present, it will be known by the diffusion of the ammoniacal odour.

ON THE ZEA MAYS AND OTHER CEREALIA OF WESTERN AFRICA.

BY WILLIAM F. DANIELL, M.D., F.R.C.S.,
Assistant Staff Surgeon, &c.

(Continued from page 352).

III. *PENICILLARIA SPICATA*, Swartz. — *African Millet*. Class Triandria Digynia: Nat. Ord., Gramineæ. This is another indigenous cereal, whose culture in former times was more zealously cherished on the Gold Coast and the inland provinces of Akim and Ashanté than at present. It may, however, still be noticed flourishing in the environs of Akkra and other maritime districts as far as the Rio Formosa, and also in the Senegal and Gambia rivers, with other countries of central Africa, bordering on the course of the magnificent Kowarâ, whose inhabitants, to a large extent, derive their ordinary support from the facility of its growth and copious fruition. From the traditional history of a few native tribes sufficient information may be gathered to warrant the remark that this grain constituted the most ancient kind of food, adopted by their primitive forefathers, and on this account was especially dedicated to the celebration of the more august feasts and religious ceremonies, the fetishmen and other sacerdotal authorities distinctly pointing out this curious circumstance to confirm the truth of their assertions, and to afford the best evidence of its consecration and descent from an immemorial source. At the grand harvest festival of the Akkrahs and Adampés, denominated Homowah, this millet is baked into delicate loaves, which are freely distributed by the priests to their families, relatives, and those opulent votaries who have expressed the sincerity of their devotions, by partaking of this sanctified produc-

tion, as a gift vouchsafed by the beneficence of the supreme deity. It constitutes the *kouskous* of the Joloff's and Moorish nations, the *dra* and *bishna* of Tripoli, and the (قصب or قسب) gussub of the Sahara and Soudan. In Nubia it is designated هرنة *herneh*, and in Egypt as دخن.

As the knowledge we possess concerning this plant is rather circumscribed, the Botanical outlines are now fully subjoined.

Penicillaria, Swartz.—Spiculæ solitariae, vel geminae, involucretae, bifloræ; flores bipaleacei, inæquales; superior hermaphroditus, inferior brevior masculus interdum hermaphroditus, superiori similis. Involucrum, dimidiatum, multisetum persistens; setis inæqualibus, hispidoscabris. Glumæ 2-brevissimæ inæquales hyalino-membranaceæ. Hermaphr. Palea inferior herbacea concava; superior tenuior 4-nervia. Squamulæ nullæ. Stamina 3. Antheræ lobis terminalibus barbularis. Ovarium glabrum, ad basim styli interiori cuspidatum. Stylus terminalis, elongatus. Stigma bifidum, plumosum; pilis hyalinis, simplicibus, papilloso-denticulatis. Caryopsis . . . Gramen erectum, ramosum, ramis faretis. Folia plana membranacea; nervo medio crasso, subtus prominente. Ligula brevissima, ciliata. Panicula simplex, oblongo-cylindræa; ramis simplicibus, sparsis vel subverticillatis, apice spiculas 1—2, gerentibus patentissimis rhachique pilosis.

P. spicata, Willd. *Enum.* 1037. *Jacq. Eclog. Gram.* t. 17. *Beauv. Agrost.* 58, t. 13, f. 4. *Link. Hort.* 1, 221. Panicula subspicata, cylindræa, elliptica involucrellis setaceis scabris; culmi geniculis villosis. Willd. *Holcus spicatus*, Linn. *Spec.* 1483. Willd. *Sp.* 4, 938. *Panicum spicatum*, Roxb. *Flor. Ind.*, 1, 286. *Pennisetum typhoideum*. *Pers. Syn.*, 1, 72, *Delile, Ag.* 17, t. 8, f. 3, *Cenchrus spicatus* Cav. *Prael.* *P. Plukenetii*. *Link. Hort.* 1, 221 (*Pluk. Alm.* t. 32. f. 4) *Pennisetum purpureum*, Thon. *Brik.*, 64. f. 26. *Kunth Enum. Plan.* v. i., p. 165. *Loc. Syn. Akkrah. Mah. Nufé, Okkablebba* Hausa *Geeroh*.*

On the Gold Coast, the purposes to which this grain has been applied, consist in its formation into a species of bread, resembling the kankie, after having



Penicillaria spicata.

* From the observations of Delile it would appear that the designation of *dochn* has been indiscriminately bestowed on different sorts of millet, as that of *durra* is on the Guinea and larger kinds of corn. Thus the zea mays is called دؤرر كيزان *dourra kyzan* by the Egyptians, but if procured from Turkey or Syria is known as *D. Tourky* and *D. Shamy*. The general application of these terms, without reference to any particular grain, or the plant that furnishes them, renders the aboriginal nomenclature extremely perplexing to those unacquainted with their variations, which, moreover, is greatly increased by the orthographical vagueness in which they are sometimes written. For example, the word *durra* is written *dora*, *dorah*, *dorah*, *dourra*, *dhourra*, &c. These remarks will equally apply to several other terms employed in this paper.

previously been submitted to the action of the grinding stones, and reduced into a fine meal. It is mostly eaten by the upper ranks, or is confined in other localities to those sacred festivities above mentioned. At Bathurst in the Gambia, the Jolloffs, and neighbouring races, are devotedly attached to the preparation of what may be considered their favourite dish, one in constant demand, and dressed in the following manner:—

The seeds, with their husks, are well pounded in a deep wooden mortar, by one or two females, and their clearance effected from the latter, by repeatedly pouring the sifted portions from one calabash into another, at that height as would permit the wind or breath to disperse the lighter fragments. The grain, thus divested of the external sheath, is returned to the mortar, and beaten into a soft flour. Water is subsequently added, until the whole assumes the consistency of a dry paste, and the calabash containing the mass, continually shaken by a peculiar rotatory motion, by which the contents gradually resolve themselves into minute granular particles, closely analogous to those of sago.

In this state it is deposited in a large earthen cooking-pot, pierced beneath by a number of small apertures, through which the steam ascends, from a second appended below and filled with water. When the latter is heated the vapour escapes upwards, permeates, and efficiently softens the whole. In the water is often boiled a piece of salt pork, if obtainable, a fowl or two, and a few vegetables, but various kinds of fish, either fresh or cured, and duly seasoned with condiments, are more generally in vogue with the recommendation of being less expensive. This diet is that which is said to be swallowed in such immoderate quantities by the Moorish and negro women, to create that excessive *embonpoint* which enhances the price of their charms, and is deemed by them to be an essential attraction in their personal contour.

In Bornou, Major Denham states, that this millet, equally prevalent amongst people of all grades, and upon which animals are also fed, is named *gussub*, and is widely known. "It is produced in great quantities and with scarcely any trouble. The poorer people will eat it raw, or parched in the sun, and be satisfied without any other nourishment for several days together. Bruised and steeped in water it forms the travelling stock of all pilgrims and soldiers. When cleared of the husk, pounded, and made into a light paste, in which a little *melohéia* (the *eboi ochra* of Guinea) and melted fat is mixed, it forms a favourite dish, and is called *kaddell*."†

Independently of an inebriating liquor compounded by a process somewhat similar to that from the maize, another pleasant drink is made from *gussub*, prepared solely with this intent, which is much prized by travellers for its tonic and refrigerant properties, along the arid and sultry routes they have to pass. The cultivation of this and the Guinea corn takes place during the continuance of the rainy season, and differs slightly from the plan pursued with regard to the *zea*. A curious circumstance may be alluded to in connection with these products, viz., that in all the countries where they are grown, no sooner does the grain begin to ripen, than immense flocks of small birds congregate to prey upon them; and the natives, to avert the havoc that would otherwise result from their depredations, erect lofty stages in their fields, on which are stationed women and children to scare away the intruders, by their vociferous exclamations and outrageous gestures.

The various modes in which the flour or meal of the above mentioned cereals has been dressed in northern Africa, have already been enumerated by different travellers under the designations of *Dweeda*, *Mogatta*, *Cuscousou*, *Atila*, *Zumeita*, *Bread Fetaat* and *Bazeen*, or as the latter is called in Fezzan *أسيدي* *aseedā*. Millet and barley are said to be the most popular productions in Tripoli and the circumjacent provinces.

IV. *PASPALUM EXILE*, *Sierra Leone Millet*. Class Triandria, Ord. Digynia,

† Travels in Northern and Central Africa, p. 816.

Nat. Ord. Gramineæ.—Within the last few years another kind of grain, chiefly confined to the districts in the neighbourhood of Sierra Leone, and ordinarily cultivated by the Soosu, Joloff, Bassa, and Foulah settlers, by whom it is termed “hungry rice,” has been fully described by Mr. R. Clarke, one of the assistant surgeons of that colony, under its native designation of *Fundi*, or *Fundungi*. It is sown in the months of May and June, the period when other varieties of corn are usually put in the ground, and like them, ripens in September, is subsequently cut down, collected into small sheaves, and placed in some dry spot within the native tenements. Mr. Kippist, to whom specimens of the grass were furnished, has regarded it as an undescribed species, although specimens were collected by Afzelius, and noted by him that it was much grown by the negroes of Sierra Leone. Mr. Kippist has distinguished it by the name of *Paspalum Exile*.

Paspalum, Linn.—Spiculæ bifloræ, cum pedicello articulatæ, tardius; deciduæ; flore inferiore, unipaleaceo, neutro membranaceo mutico; superiore bipaleaceo, hermaphrodito. Gluma 1 (rarissime 2, inferior minuta) superior (exterior), longitudine floris neutrius. Flos, hermaphroditus: Paleæ 2, coriaceæ, muticæ; inferior concava, superiorem binerviâ amplexens. Stamina 3. Ovarium glabrum, styli 2 terminales liberi. Stigmata aspergilliformia; pilis subsimplicibus, denticulatis. Squamulæ 2 integræ, glabræ, carnosæ, truncatæ vel dolabriformes; ovario breviores. Caryopsis embryoni parallele compressiuscula, glabra, paleis induratis inclusa. Gramina plerumque tropica. Rhachis spicata, inarticulata. Spiculæ unilaterales. A Panico distinctum nonnisi gluma inferiore plerumque abortiente. *Kth. Enum. v. i., p. 40.*

Paspalum exile, Kippist. Glaberrimum, caule filiformi, racemis subternis digitatis, axi partiali spiculis singulis angustiore, spiculis parvis sub-biserialibus pedicellatis, glumis ovatis acutiusculis paleis æqualibus, foliis lineari-lanceolatis margine serrulatis. Gramen sub-bipedale, inferne ramosum; racemi tenues, 3—4-pollicares, subsessiles; axes partiales angustissimæ, planæ, margine minutè denticulatæ; spiculæ vix lineales; glumæ exterioris respectu racheos (valvulæ floris masculi superstitis), nervi 7—9 æquidistantes, interioris 5, quorum laterales approximati; paleæ minutissimè striatæ; folia plana; vaginæ longissimæ; ligulæ truncatæ integræ. *Proc. Linn. Soc., p. 156-7, 1842.*

Mr. Clarke states that the grain “is trodden out with the feet, and is then parched or dried in the sun to allow of the more easy removal of the chaff in the process of pounding, which is in wooden mortars. It is afterwards winnowed with a kind of cane fanner on mats. When prepared for use it is first thrown into boiling water, in which it is assiduously stirred for a few minutes. The water is then poured off, and the natives add to it palm oil, butter, or milk; but the Europeans and negroes connected with the colony stew it with fowl, fish, or mutton, adding a small piece of salt pork for the sake of flavour, and the dish thus prepared is stated to resemble kous-kous. The grain is also made into a pudding with the usual condiments, and eaten either hot or cold with milk; the Scotch residents sometimes dressing it as milk-porridge.”*

V. *Pennisetum dichotomum*, Delile. Class Triandria, Ord. Monogynia, Nat. Ord. Gramineæ.—To the preceding cereals must be also appended this grass, which, applied to many useful purposes in Northern Africa, is as highly appreciated in other parts of the interior for the seeds it affords, and which form an article of food in great request amongst several of the native tribes. It is the same grass mentioned in Denham and Clapperton’s travels, that gave so much trouble and annoyance to these travellers in their route from Agadem to Woodie, the whole surface of the country between these places being thickly covered for miles in every direction; it was deemed one of the greatest pests to both man and beast, from the prickles of the involucre being of a “fine and penetrating sharpness,” and closely adhering to every substance they came in contact with. This plant abundantly grows in the deserts of Egypt and Arabia

* *Proc. Linn. Soc., ubi sup.*

where it is readily recognized by the country term of *متم* *temam*, or *tummum*), in Bornou and Soudan, and also in different localities of Western Africa.

PENNISETUM, Beauv. *Penniseti species, Rich.*—Spiculæ bifloræ, solitariae, geminae vel plures, involucriatae; flore superiore hermaphrodito; inferiore neutro vel masculo, rarissime fertili 1-2 paleaceo, membranaceo. Involucrum setosum, una cum spicula deciduum; setis interioribus inferne plumosis. Glumæ 2, inæquales, membranaceæ, concavæ; inferior rarissime abortiens. Paleæ floris hermaphroditi magis minusve coriaceæ, concavæ, inferior superiorem amplectens. Stamina 3. Ovarium glabrum; Styli 2 terminales, elongati, sæpe inferne connati. Stigmat-plumosa; pilis simplicibus. Squaamulæ minutissimæ vel plerumque nullæ. Caryopsis embryoni parallele compressiuscula, glabra, paleis coriaceis inclusa libera. Gramina ramosa, facie Setariæ glaucæ. Folia plana. Spicæ cylindricæ, simplicis terminales rhachis non articulata.

P. dichotomum. Delile Egypt. 15, t. 8, f. 1. (v. s.). Link. Hort. 1, 214. Culmo junceo, diffuso; foliis pagina superiore scabris; ramis erectis, subterno fasciculatis; spicis terminalibus, flavidis; rhachis aspera, glabra. *Delile.* Squamulæ certe nullæ. Ovarium oblongum, sessile, glabrum. Stylo duo terminales elongati, capillacei, glabri, liberi.

Stigmata longitudine stylorum, plumosa; pilis simplicibus vix denticulatis. *Kunth. Enum. Plan., vol. i., p. 2, p. 116.* *Panicum dichotomum. Forsk. Desc. 20.* *Phalaris setacea. Forsk. Desc. 17 (teste Delile).* *P. Phalaroides. Schult. Mant. 2, 147. Nees ab Esenb. in Mart. Bras. 2, 283 (teste syn. Forsk.).* Arabia. Egyptus. Willdenow *Phalaridem setaceam ad Panicum polystachyum, Linn. ducit. Kunth. Enum. Plan. 1, 161.* In Bornou, and other adjacent kingdoms, the seeds of this grass, known under the name of *kasheia*, are prepared for food, by being denuded of their husks, and dried in the sun, and well pounded or bruised, after which they are converted into a kind of bazeen, or eaten like rice. In consequence of the labour required in some of these dishes, and the difficulty that such obstacles offer to their popular use, they are esteemed as one of the luxuries of wealth and rank. Forskal states, that this plant constitutes the common fodder of camels and asses in Egypt and Arabia, and is likewise employed to thatch the native huts. The roofs and walls of these tenements being framed with slender sticks, bound transversely with others, are externally covered with tightly compressed bundles of the dried grass, frequently united with another, termed *بكار* *Bockar (Panicum turgidum, Forsk.)* to about the depth of a foot, firmly fixed by the aid of narrow ligatures. They are impervious to the rain, and usually last five or six years, after being finished internally with a



Pennisetum dichotomum.

whitewash of lime or gypsum.* The feathered tribes are also said to be extremely partial to this grain, which often serves them with an ample sustenance, in those desert regions, where but little vegetable food can be obtained.

VI. *ORYZA*, Linn.—*Common Rice*. Class Hexandria Digynia, Gramineæ Spiculæ unifloræ. Glumæ 2 parvæ membranacæ, concaviusculæ, muticæ. Paleæ 2 chartaceo-coriacæ compresso-carinatæ, longitudine subæquales, clausæ inferior multo latior apice plerumque aristata: arista recta, basi subarticulata. Stamina 6. Ovarium glabrum. Styli 2 terminales. Stigmata plumosa; pilis ramosis. Squamulæ 2 glabræ, subcarnosæ. Caryopsis glabra oblonga, cotyledoni contrarie compresso-tetragona lævis paleis persistentibus clausis arcte obiecta, libera (paleis adnata teste Schreb.) Gramina exotica. Folia plana. Paniculæ ramosæ. Spiculæ pedicellatæ in ramulis racemosim dispositæ cum pedicello articulatæ, compressæ, hispidæ. (Kunth).

O. sativa, Linn Sp. 465. Willd. Sp. 2, 247 (*Catesb. Car.* 1, t. 14) *Lam. Encycl.* 6, 218. *Desv. Journ. de Bot.* 2, 76. *Nees ab Enseb. in Mart. Flor. Braz.* 2, 517. Foliis linearibus, elongatis, scabris, panicula racemosa, contracta, ramis infirmibus, scabris; glumis linearilanceolatis, muticis cordatove-aristatis. *Nees. Kunth. Enum. Plant. v. i.*, p. 7.

This plant, so frequently found in almost every quarter of the globe, is also indigenous to several of the regions of Western Africa. In Egypt and other parts of Northern Africa it is named ارز *arz*, or رز *rouz*. On the Gold Coast it has excited but scanty attention, and apparently has never been much cultivated, unless in the neighbourhood of Appollonia and Axim, and the maritime districts located more westerly. It is likewise uncommon in the marshes and alluvial lowlands of the Gulf of Guinea, so favourably adapted for its growth, and is only observed in the interior countries of Haussa, Nufe, and Yorruba, where considerable quantities are annually reared for the native markets. In the vicinity of Rabbah and other Fellata towns near the confluence of the Tsadda, extensive tracts of land are constantly irrigated for its production, while the swampy expansions and fertilized banks of the Kowara and its tributary streams are rendered available for the same purposes. In these parts an abundant supply can mostly be procured, except in the kingdom of Bornou and the surrounding districts fringing the great desert, where the soil is unfavourable for its cultivation. The portions of tropical Africa, however, which yield the largest amount of this important grain, are the Kroo coasts, and those numerous rivers intersecting the country between them and the Senegal northwards, where it is so plentifully sown as to comprehend the chief article of food on which the inhabitants of many localities have to subsist. Converted by the Fantes into kankie-cakes, and the Mandingoes into a variety of tasteful preparations, it has so far enjoyed the reputation of being one of the most healthy and nutritious of all the farinaceous products devoured by the native races.

The effects produced on the physical development of the African nations from the constant use of the preceding aliments are worthy of consideration. There can be little doubt that communities so supported are endowed with a greater constitutional vigour and robustness than those that have been nurtured on yams, cassada, and other vegetable esculents; and, moreover, are better fitted to resist the enervating influences of labour and climate. Hygienic regulations, the result of an improved code of dietetics from higher social customs, have likewise contributed to favour this distinctive superiority, and hence a tendency to the assumption of certain adynamic types of disease is less manifested. But while this exemption, to some extent, takes place in populations whose physical amelioration partly proceeds from the sort of farinaceous food on which they are fed, conjoined with other endemic agencies, a predisposition naturally follows towards the induction of an opposite class of maladies, chiefly distinguished by the sthenic action they exert on the epidermal and mucous membranes of the body. This special prevalence may be remarked in many

* *Flora Egypt. Arab.*, c. 1. p. 20.

regions of tropical Africa, where the grossness and uniformity of diet has led to those disordered states of the chylipoietic viscera, which promote the generation of such entozoa as are known to infest the internal cavities and parenchymatous structures.

On the Gold Coast the predominance of various species of intestinal worms, particularly the *lumbicus teres*, has frequently been observed, and though the *ascarides* are to be found in an almost equal ratio, they are much more prevalent amongst the inhabitants of the swampy lowlands, who live but indifferently and on substances of a poorer quality. It may, however, be considered somewhat questionable whether these particular kinds of nutriment predispose the body to the germination of the *Filaria medinensis*, so extremely common to all grades of people on this coast; a probability rather feasible, but unfortunately, from the insufficient data we possess, cannot be satisfactorily verified. The effects more obviously proceeding from this addiction to such farinaceous edibles (rice being excepted) is that general torpor and constipation of the bowels to which the natives are so liable, and which they endeavour to avert by introducing oleaginous soups and stimulating condiments into their dishes, or to remove by the daily employment of emollient enemata, from the frequency of whose requisition may be inferred the inefficiency of the former means. Apparently analogous irregularities of the intestinal canal may be traced to the same causes among the modern Peruvians, from similar varieties of food, they, according to Dr. Von Tschudi, being under the necessity of eating the fruit of the *Erythroxylon coca*. Lam. to obviate the inconveniences that proceed from these sources. He remarks in his interesting work, that the sustenance of "the Indians consists, almost exclusively, of vegetable substances, especially roasted maize and barley, converted into flour by crushing, which they eat without the admixture of any other substance. The continued use of this farinaceous food occasions severe obstructions, which the well known aperient qualities of the coca counteract, and many serious diseases are thereby prevented."* Among European residents in Africa, these native preparations of corn exert, at first, a purgative action, which, however, soon ceases, when the system has become more habituated to their effects.

ON THE SPONTANEOUS DECOMPOSITION OF GUN-COTTON AND ALLIED SUBSTANCES.

BY J. H. GLADSTONE, PH. D.

THE subject of the spontaneous decomposition of gun-cotton has already been brought before the readers of the *Pharmaceutical Journal* by Mr. Tustin, in a communication to which Dr. Pereira also added a few remarks;† but the *rationale* of the change is not rendered evident either there, or anywhere else, as far as I can ascertain. Whilst investigating the "Chemical History of Gun-Cotton and Xyloidine,"‡ I made a variety of samples of the different substances produced by the action of nitric acid on woody fibre and starch; and, subsequently, when at Giessen four years ago, I formed similar compounds from sugar, mannite, gum, &c. Now as many of these have suffered either partial or complete decomposition, it may not be unsuitable to place upon record in your *Journal* the changes which have happened.

Gun-cotton, as ordinarily produced, especially for the preparation of collodion, is a mixture of two distinct though analogous substances. The one is designated pyroxyline, and has the formula $C_{24} \left\{ \begin{smallmatrix} H_{15} \\ 5 NO_4 \end{smallmatrix} \right\} O_{22}$, assigned to it in my paper; it leaves no residuum on explosion, is insoluble in ether, &c. The other has received the appellation Cotton-xyloidine, and the formula $C_{24} \left\{ \begin{smallmatrix} H_{17} \\ 3 NO_4 \end{smallmatrix} \right\} O_{22}$;

* Travels in Peru, p. 452.

† *Pharm. Journ.*, ix., p. 405.

‡ Published in *Chem. Soc. Mem.*, iii., p. 412.

it leaves a residue on explosion, is soluble in ether, &c. The remark of Mr. Tustin that his decomposing gun-cotton was soluble in ether, proves that it was, partly at least, this latter compound, and not the more explosive one. I shall speak of each of these descriptions of gun-cotton separately.

Pyroxyline.—This substance is produced only when cotton, or cotton-xyloidine, is immersed in a mixture of nitric acid of sp. gr. 1.5 with strong oil of vitriol. Although it contains so large an amount of oxide of nitrogen, I am acquainted with no clear instance in which it has undergone spontaneous decomposition. Specimens obtained by the action of the mixed acids on cotton-xyloidine have shown no indications of change; and pyroxyline obtained in a compact translucent form, from solution in acetic ether, has also remained unaltered.

Cotton-Xyloidine.—This may be prepared in a state of purity, and in a pulverulent condition, by dissolving cotton, or pyroxyline, in nitric acid of about sp. gr. 1.45, and precipitating the substance by water.

Several specimens of this compound made from both sources have hitherto suffered no decomposition, but they have been generally kept in the dark. One sample of precipitated cotton-xyloidine placed in a stoppered bottle remained in a cupboard, the door of which was sometimes opened, sometimes closed. After the lapse of about three years it suddenly began to evolve nitric oxide and water; the action continued for a few weeks, and then nothing remained but a small quantity of a transparent gummy mass of a light brown colour, and possessed of a very peculiar odour. Several months produced no further alteration. This product of decomposition, which had about the tenacity and consistency of ordinary gum, was not explosive: when heated in a closed tube, *per se*, it gave off red fumes, and afterwards swelled up, being carbonized, and evolving empyreumatic oils. It was found to be insoluble in cold water; but when boiled in that liquid, it swelled up as a gelatinous mass, and became disintegrated. There resulted a solution which reddened litmus paper slightly, containing, however, no oxalic acid, but a small quantity of another acid which gave a flocculent white lead salt, insoluble in excess of acetic acid. The substance in question, though insoluble in cold water, dissolved readily in aqueous solution of potash; yet it appeared to be altered in combining with the alkali, for it was not reprecipitated when the potash was supersaturated by an acid.

Starch-Xyloidine.—This is the well-known substance produced when starch is treated with strong nitric acid, and water is added to the viscid mass. Its composition varies; but it is in general analogous to, if not identical with, that ascribed above to cotton-xyloidine.

A large specimen, freely exposed to the light during more than four years, has remained unaltered.

Higher Starch Compound.—When ordinary starch xyloidine is treated with a mixture of fuming nitric and sulphuric acids, and subsequently washed, it is found to have greatly increased in weight. The resulting substance is more combustible than the original xyloidine, and differs from it in several respects, but it is not identical with the pyroxyline obtained from woody fibre.

A sample of this product, which had been left eight or nine months in a room where light freely entered, was found wholly decomposed. Nitrous fumes and vapour of water had been evolved, leaving a dark, sticky residue. This new substance was soluble in water and in alcohol, crystallizing from the latter in tufts, which, under the microscope, had a beautiful arborescent appearance. It remained a couple of years or more, dissolved in a very small quantity of water. What changes may have taken place in it during that period is unknown, since no proper examination had been previously made, but after the lapse of that time the solution was found to be almost black, and strongly acid. When neutralized with an alkali, it gave a copious precipitate on the addition of nitrate of silver, and a flocculent salt, or rather mixture of salts, with chloride of calcium, which, when dried and heated with hydrate of potash, evolved ammonia. At the bottom of the vessel containing the aqueous solution, there had grown a compound crystal, transparent and colourless, with the exception

of a few brown specks. It had the rhomboidal form, which oxalic acid usually assumes, and, upon further examination and analysis, proved to be that substance.

A small sample of this same starch compound, which had been washed repeatedly with glacial acetic acid for complete purification, and which had been kept constantly in the dark, was found to have suffered decomposition, nothing remaining but a viscous acid liquid.

When examining these decomposed explosive compounds, I found in my laboratory a bottle filled with a brown sticky mass; the label having been destroyed by evolved acid, it could not be positively identified, but I have good reason to believe it had originally been this higher starch compound. The substance had a strong odour of hydrocyanic acid. Its solution, either in water or alcohol, had a strong acid reaction. It gave no precipitate with chloride of calcium. Flocculent salts, containing metallic oxides or baryta, all easily soluble in nitric acid, were readily produced. Its combinations with the alkalis gave dark brown aqueous solutions, from which they separated in an amorphous form on evaporation; but though exceedingly soluble in water, they were precipitated on the addition of alcohol. The mass was probably a mixture of different acids, principally non-azotized, for little nitrogen was discoverable, and although oxalic acid itself was absent, it is by no means improbable that some higher members of the series $C_n H_n - O_n$ were present.

Nitro-Mannite.—This substance, first described by MM. Flores Domonte and Menard,* is formed when mannite is dissolved in fuming nitric acid, and precipitated by sulphuric acid. Its formula, according to Strecker†, is $C_{12} H_2 (NO_3)_6 O_{11}$. It is the only known crystallizable body belonging to this group.

My sample of nitro-mannite, kept in a glass tube generally in the dark, has suffered some decomposition, acid fumes have been given off, but the action has not proceeded far.

Sugar Compound.—It is well known that cane-sugar submitted to the action of mixed nitric and sulphuric acids, is converted into a pasty explosive substance, readily soluble in alcohol, but insoluble in water, to which, however, it communicates an intensely bitter flavour. According to the observations of H. Vohl, several different compounds are produced simultaneously in this reaction. Diabetic sugar similarly treated, gives a similar substance.

I have kept samples of this product, some of which had been merely kneaded with water until the acid was removed, others regained from solution in alcohol. They have shown little signs of decomposition.

Milk-Sugar Compound.—By the same treatment, a substance is obtained from milk-sugar closely resembling that just described. Like the previous compound, it can be purified by solution in alcohol, but does not present itself in a crystalline form.

A sample, kept in paper, was found to be much decomposed.

Caramel Compound.—I procured a similar compound from pure caramel, prepared by means of absolute alcohol. The caramel, having been dried and pounded, was placed in fuming nitric acid; it dissolved; upon the addition of sulphuric acid, a dark coloured oil separated, which became hard and yellow, when washed with water. It was soluble in alcohol, but came out from solution without crystallizing, and always of the same colour. The compound bore a close resemblance in its various properties to those obtained from sugar.

The sample kept by me has suffered little or no alteration.

Gum Compound.—At least two different substances of this explosive character may be produced by the action of nitric acid on gum. If the gum be treated with the fuming acid, it dissolves into a mucilaginous solution, from which water precipitates a white body, slightly soluble in that liquid, and very soluble in alcohol. A sample of this substance has not yet suffered any decomposition.

* *Comptes Rendus*, March 8th, 1847.

† *Ann. Chem. u. Phar.*, lxxiii., 59.

If sulphuric acid be added to the solution of gum in fuming nitric acid, it precipitates a white substance, resembling that from sugar, but not nearly so soluble in alcohol, and very slightly so in ether. Moreover, it is only softened, not melted, by a temperature of 212° Fahr. No specimen of this compound was preserved.

Whilst treating upon this subject, it may not be amiss to append a few observations upon another decomposition of pyroxyline. When good gun-cotton is heated at a temperature a little exceeding that of boiling water, it becomes brown in colour, and is disintegrated. The odour of nitrous fumes, along with that of some cyanogen compound, are very perceptible. It thus becomes explosive at a lower temperature than formerly; a fact which may account for some of those hitherto unexplained accidents which have arisen from this article; for it is evident that gun-cotton exposed for some time to a degree of heat quite insufficient under ordinary circumstances to cause explosion, may yet be eventually dissipated from the formation of this product. The brown substance thus obtained underwent no visible alteration in the space of four years. When examined lately, it was found to be very soluble in water, but insoluble in alcohol or ether. Its aqueous solution tasted somewhat bitter, it reacted slightly acid, no crystals were obtained on evaporation. When boiled with a solution of potash, it evolved ammonia. When mixed with a salt of lead or copper, it formed brown flocculent precipitates, but none appeared with a silver or lime salt. The organic substance which fell in combination with oxide of lead, contained a large amount of nitrogen. That portion of the fibre which had not become brown by the heat, was found to be no longer pyroxyline. When freed from the brown matter by washing with water, and dried, it left little residue on explosion, but, on the other hand, it dissolved very readily in ether, alcohol, or cold sulphuric acid, properties of cotton xyloidine, but not of the original substance. When, however, the manner of its production is considered, we can hardly conceive it identical with a body which would require the introduction of two atoms of hydrogen, if formed from pyroxyline. Whether this change which gun-cotton undergoes at a high temperature is at all analogous to the spontaneous decompositions mentioned above, can scarcely be determined, but the presence of azotized compounds in considerable quantity, and of ammonia, rather indicates the reverse.

The *rationale* of these decompositions is far from being elucidated by the observations here recorded; but as the substances themselves are not now in existence, nor are capable of being procured without long delay, I cannot pursue the investigation further. The only general conclusion which can be drawn appears to be, that several substances of the character above described have a tendency to suffer spontaneous decomposition from being oxidized into non-azotized acids at the expense of the peroxide of nitrogen, NO_2 , they contain, which is reduced to the condition of nitric oxide, NO , and evolved as such, a portion of water being always given off at the same time.

St. Thomas's Hospital, Feb. 16, 1852.

A SHORT NOTICE OF THE PHARMACOPŒA FENNICA, AND PHARMACY IN FINLAND.

BY DR. N. P. HAMBERG,

Assistant Professor of Pharmacy to the Royal Caroline Institution, and to the Pharmaceutical Institution of Stockholm.

(Continued from page 356.)

As I consider it useful for medical and pharmaceutical men to know the difference of the names and of the compounds of the same medicines in neighbouring countries, I have noted the following comparison between some medicines in the Finnish and the Swedish Pharmacopœias.

Pharm. Fennic., Ed. II.

Acidum gallotannicum.

Acidum nitricum purum dilutum, gr. sp. 1.20.

Acidum hydrochloricum purum, gr. sp. 1.16.

Chlor.-amidetum hydrargyricum (Hg Cl + Hg H₂N). Precipitated by ammonia.

Chloretum baricum.

Chloridum formicum. (Superchloridum.)

Liquor acidi citrici.

Liquor ammoniaci caustici.

Liquor chloreti hydrargyrico-ammonici.

Liquor sesquicarbonatis ammonici pyroleosi (is prepared through solution of 3j sesquicarbonas ammoniac. pyroleos. in 3iv. aqua destillata).

Oleum animale fetidum.

Pasta gummosa.

Spiritus vini rectificatissimus, sp.gr. 0.83

Spiritus vini rectificatus, sp. gr. 0.89.

Sulphuretum stibico-hydrargyricum.

Tinctura opii crocata. (Laud. Liquid. Sydenh.)

Vinum opii crocatum. (Elixirpapaveris.)

We find vinum opii crocatum in both Pharmacopœias, but so different that if taken in the same dose, the one is an innocent medicine, but the other a poison, as will be obvious by comparison of the following formulæ :

Vinum Opii Crocatum.—Ph. Fennicæ.

Opii levantici pulverat. scrupul. octo.

Vini de Malaga lbj 3viiij.

Stigmat. croci. sativi. scrupul. decem.

Succi liquiritiæ dep. 3j.

Pondus vini parati 3xx æquale sit. oportet.

Pharm. Svecic., Ed. VI.

Acidum quercitanicum. (Acid. tannicum. Ph. Lond.)

Acidum nitricum dilutum, gr. sp. 1.25.

Acidum hydrochloricum. gr. sp. 1.19.

Mercurius præcipitatus albus (HgCl + H₂NCl) + (HgCl + HgO), precipitated by carbonate of potash from Alembroth salt solution. (Hydrargyri ammonio-chloridum. Phar. Lond.)

Chloretum baryticum. (Barii chloridum. Ph. Lond.)

Chloroformium (Ph. Mil., 1849.) (Chloroformyl. Ph. Lond.)

Succus citri.

Ammoniacum causticum. (Ammoniac liquor. Ph. Lond.)

Mixture mercurialis.

Liquor cornu cervi. The alkaline liquor obtained by distilling hartshorn, sp. gr. 1.06.

Oleum cornu cervi empyreumaticum.

Pasta althææ.

Spiritus concentratus, sp. gr. 0.84. (Spiritus rectificatus. Ph. Lond. sp. gr. 0.838.)

Spiritus dilutus, sp. gr. 0.90. (Spiritus tenuior. Ph. Lond. sp. gr. 0.920.)

Æthiops antimonialis.

Vinum opii crocatum. (Laudan. Liquid. Sydenh.)

Vinum liquiritiæ thebaicum. (Elixir papaveris.)

Vinum Opii Crocatum.—Ph. Svecic.

Cinnamon. Ceylanic cortic.

Caryophyllorum singulor. 3j.

Croci orientalis 3j.

Opii levantici pulverati 3j.

Vini de Malaga lbj.

Fiat colatura libræ unius.

The Finnish preparation contains in one drachm the soluble matter of a grain of opium, but the Swedish preparation contains the same quantity of opium in six grains only. It is to be hoped that in a new edition of the Pharm. Svecic.* another name will be adopted, in order to prevent mistakes.

Lastly, I cannot omit to mention that of medicines very commonly used in other countries, I have only missed one in this Pharmacopœia, viz., Hydrargyrum cum Cretâ, which has not been introduced.

The Supplement has the title "Anvisning till Igenkännande och Pröfning af Läkemedlen i Finska Farmakopeens Andra Upplaga. Helsingfors, 1851." The Introduction contains pp. xxiii., and the Supplement itself, together with the Register, pp. 192. The Preface of this work mentions that it has been

* The Finnish Pharmacopœia has the priority, as the name vin. opii crocatum is already adopted for elixir papaveris in the first edition of Pharmacopœia Fennica.

written in the Swedish language as being more easy to be understood by the Dispensing Chemist, and that the work must be considered as an attempt at a Pharmacognostic Manual, which will be of use to the Chemist in purchasing drugs or testing medicines, and also to those physicians whose duty it is to inspect the shops.

Pages vii. to xxiii. contain a very complete list of those articles which must be used in examining and testing medicines. We also find here instructive directions for the employment of the tests.

The directions given in the Supplement for the examination and testing of medicines are very good, and are highly creditable to the authors. I cannot avoid the pleasure of specially noticing the tests for *aqua amygdalarum amararum concentrata*, page 16; *bicarbonas kalicus*, page 23 (the quantity of carbonic acid contained in this preparation is determined by expelling this acid by means of sulphuric acid, and estimating the loss which must be due to carbonic acid by a balance); in the same manner are tested *bicarbonas natricus*, *carbonas kalicus depuratus* and *venalis*, and *carbonas natricus depuratus*. Moreover, the tests for *hypochloris calcicus*, *liquor arsenitis kalici*, *liquor chlori*, *superoxidum manganicum nativum*, &c.

I am sorry to say that I cannot give the same praise to the descriptions of the characteristics and properties of the drugs, some of which are very incomplete, and not so instructive as is desirable for a work intended as a pharmacognostic manual.

In this respect I may mention the description of *aloes*, page 14, about which the Supplement merely tells us "that the best kind of *aloes* which at present is to be found in commerce, is *aloë Capensis*." The descriptions of *gumi resina*, *scammonium Aleppense*, *moschus*, *opium*, and *secale cornutum*, are also not very complete.

Information of what kind of a drug, which has several commercial varieties, must be kept by the dispensing Chemist, is sometimes not very definite, viz., *castoreum*, *cort. chinæ*, *fol. sennæ*, *resina benzoë*, *semina cacao*.

From the political relations of the countries, it will be readily understood, that the regulations belonging to Pharmacy in Finland must be very much the same as in Sweden, viz., it is not lawful to keep a shop without Pharmaceutical practice for several years, and passing a strict examination. The shops in Finland are commonly large and well fitted up, and their number is limited. Inspections of the shops are performed annually. The medicines are good, adulterations being very rare. Poisoning is prevented by strict interdictions.

We have received from Dr. Landerer, of Athens, a paper

ON THE SCHERBETS OF THE EAST,

from which we extract the following :—

As the prohibition of wine imposed upon Mahommedans by the Koran, has induced the use of opium as a means of producing intoxication, so it may have probably been the cause of the invention of those beverages so generally employed in the East, *Scherbet* and *Bosá*.

The Eastern *scherbets* usually consist of water in which jelly or syrup made from fruit have been dissolved, or of an infusion in water of the fruit itself; and their composition varies according to the facility with which any particular fruit can be obtained. In Egypt, a *scherbet* is prepared from the roots of *Cyperus esculentus*, which are brought to Cairo and Alexandria in considerable abundance, and sold in the bazaars combined with rice, in the form of cakes. The Egyptians also use a *scherbet* made with honey. Various ingredients, as vanilla, otto of roses, peppermint, vinegar, and even mastich, are used to impart a flavour to *scherbet*, while an agreeable colour is obtained by the employment

of cochineal, the juice of the berries of *Phytolacca decandra** or of *cornus mas*, the latter an esteemed fruit in Asia Minor. One of the chief requisites for good scherbet is cold water, which, in the absence of ice, is obtained by the use of a porous earthen vessel, like the unglazed water-bottle or Alcarraza of the Spaniards.

The beverage called *Bosá* is a sort of acidulated, and sometimes fermented, scherbet. In its commonest form, it is made by fermenting an infusion of millet seed, and in this state probably represents the barley-wine, *Oinos κριθῆς* of the ancients. A more agreeable *Bosá* is prepared by the Egyptians from tamarinds and honey, and by the Greeks from the fruit of the love-apple (*Solanum Lycopersicum*) the latter beverage being called *Αροσιστικον*.

The manufacture of these drinks gives employment to a vast number of persons called *Scherbetzides*, the peculiar sound of whose little bells, struck by a machine, which at the same time cools their glasses by a stream of water, may be heard far and near through the streets of an eastern town, inviting customers to their trays, on which syrups, fruit, and sweetmeats are displayed.

ON THE MANUFACTURE OF OXALIC ACID.

OXALIC acid is formed by the action of nitric acid on a great number of vegetable substances, such as sugar, rice, starch, washed sawdust, &c.

Sugar, either in its crystalline state, or in that of molasses or treacle, is the substance more commonly employed in the manufacture of oxalic acid.

On the addition of nitric acid to the saccharine solution and exposure to heat, a substitution of part of the oxygen of the nitric acid for the hydrogen of the sugar is effected, oxalic acid being formed, and binoxide of nitrogen evolved from the liquor. Other changes than this, however, take place; carbonic acid is often disengaged with the binoxide of nitrogen, and saccharic acid and other products remain in solution with the oxalic acid.

Instead of cane sugar or treacle, the saccharine substance formed by the action of sulphuric acid on potato or other starch (as in Mr. Nyren's process) is employed. For this purpose the potatoes are well washed, and then reduced into a fine pulp by rasping, grinding, or other suitable means; such pulp is then washed two or three times, by placing it in water and well stirring it therein, then permitting the pulp to subside, and running off the water. The pulp thus obtained is next placed in an open vessel of lead, or wood lined with lead, with as much water as will allow of the mixture being boiled freely, by means of steam passed through leaden pipes placed therein. Into the mixture of pulp and water, about two per cent. by weight (of the potatoes employed) of sulphuric acid is to be stirred in, which will be at the rate of from eight to ten per cent. of acid on the quantity of farina contained in the potatoes; the whole is now to be boiled for some hours, until the pulp of the potatoes is converted into saccharine matter; the completion of this process being readily ascertained by applying a drop of tincture of iodine to a small quantity of boiling liquor placed on the surface of a piece of glass, when, if there be any farina remaining unconverted, a purple colour will be produced. The saccharine product thus obtained is then filtered through a horsehair cloth, after which it is carefully evaporated in any convenient vessel, until a gallon of it weighs about fourteen or fourteen-and-a-half pounds; it is now in a proper condition to be employed in the manufacture of oxalic acid, by the application of nitric acid, as in the case of operating upon sugar or treacle. Horse-chestnuts, deprived of their outer shells, are also applicable to the manufacture of oxalic acid, when treated in the way above described for potatoes.

Instead of operating with sulphuric acid, the farina of potatoes and of chestnuts may be treated with diastase, and converted into a liquor similar to that obtained after evaporation from the farina and sulphuric acid before mentioned, using about the same proportion of diastase as above directed for sulphuric acid. In this case

[* The juice of the fruit of *Phytolacca decandra* has been used in Portugal for colouring wine, but on account of its purgative properties it has been very properly prohibited.—Vide Guibourt's *Histoire Naturelle des Drogues simples*, tome ii., p. 411, édit. 1849.—Ed.]

the liquor is made of the required strength at once, and the processes of filtration and evaporation are rendered unnecessary.

The apparatus required in the conversion of the saccharine matter (whether of cane sugar or formed of starch in the way above mentioned) into oxalic acid is very simple. Usually, earthenware jars of about two gallons capacity are employed, which, when charged with nitric acid and the saccharine material used, are placed in water-baths capable of holding a hundred or more of these jars. These baths are constructed of brick and lined with lead, and are heated by means of steam passed through coils of lead pipe placed therein.

Instead of earthenware jars, vessels of lead, or of wood lined with lead, may be employed in the manufacture of oxalic acid. For this purpose, square open vessels, eight feet square and three feet deep, are a convenient size, the liquor being heated by means of steam passed through a coil of lead pipe. A coil of about forty-eight feet of one-inch pipe, in a vessel of the size above mentioned, is sufficient to keep the liquor at the required temperature. In using these vessels, the liquor (whatever it may be) to be converted into oxalic acid is put into them, together with the acid employed, and heated until the required decomposition is effected. The liquor is then drawn off by a syphon, or by a cock placed at the bottom of the vessel, into shallow leaden vessels, or wooden vessels lined with lead, to cool and crystallize, and the mother-waters are drawn off from the crystals and used in the next operation.

When the manufacture of this acid is conducted in large vessels as above mentioned, the specific gravity of the nitric acid employed may be less than when the earthenware jars are used. From 1.200 to 1.270 are about the limits of the range allowed for the gravity of the acid. As regards the temperature of the baths, this should be maintained at or about 125° Fahr. Whilst the operation is in progress, the active evolution of gas, without the appearance of red fumes, and the emission of a peculiar smell, slightly indicative of the presence of nitric oxide, are amongst the signs that everything is in good working condition. The judicious addition of sulphuric acid is found to contribute to an increase of the quantity of oxalic acid produced. The product of acid from a given quantity of sugar, has been much understated by chemical writers; this has most probably arisen from the circumstance of boiling the sugar with strong nitric acid, by which means a large quantity of oxalic acid becomes converted, as soon as formed, into carbonic acid, and the result is, that the actual product of oxalic acid obtained represents only about one-half of the sugar employed, and therefore not above one-half the quantity which should have been obtained. Thus we find it stated, that from fifty to sixty pounds of oxalic acid are obtainable from 100 pounds of good sugar, whereas the quantity actually obtained in practice is from 125 to 130 pounds. Treacle of course gives a smaller product; 100 pounds of fair quality, yielding from 105 to 110 pounds of oxalic acid.

The mother-liquor having been poured off, the crystals of acid obtained are thrown on drainers and washed, then carefully dried in a suitable stove. The mother-liquors, when treated with a fresh supply of nitric acid and treacle, are ready for a further operation.

About four-and-three-quarter cwt. of nitrate of soda, and two-and-a-half cwt. of sulphuric acid, are used to furnish the nitric acid required to convert one cwt. of good sugar into oxalic acid.

Mr. Jullion has patented a process for the conversion of formic acid into oxalic acid. For this purpose, formic acid is saturated with a solution of caustic potash, and then half the quantity of caustic potash required for saturation is added to the above mixture; the whole is then evaporated to dryness, and heated to 560° Fahr. By this process, the formic acid is decomposed, and oxalate of potash formed. Caustic soda may also be employed instead of caustic potash.

The oxalate of potash or of soda thus obtained is then treated with sulphuret of barium, hydrate of baryta, or any soluble salt of baryta, whereby an oxalate of baryta is precipitated, from whence pure oxalic acid may be obtained by means of sulphuric acid.

Another mode of obtaining oxalic acid is by the process patented by Dr. Wilton Turner, who directs the uric acid obtained from guano to be treated with peroxide of lead or manganese suspended in water, at a boiling temperature, by which means it will be decomposed into oxalic acid, allantoin, and urea. The oxalic acid forms an insoluble compound with the lead or manganese. The lead process is as follows: A known weight of uric acid is placed in an open cylindrical iron vessel, capable of

holding two pounds of water for every pound of the acid, and adapted to boil by steam. A clear saturated solution of lime-water is then added, and as soon as it is heated, and in brisk ebullition, the peroxide of lead is added in successive portions, as long as it is observed to be whitened by the boiling liquid. The whitish powder thus obtained is oxalate of lead. About 240 pounds of peroxide of lead are required for each 168 pounds of uric acid employed. The supernatant liquor is next drawn off, and the oxalate of lead washed with clear water; this is then boiled with dilute muriatic acid (equal parts of acid and water), by means of which oxalic acid is obtained in solution, which is evaporated and crystallized, whilst muriate of lead remains as the precipitate.

The allantoin is also decomposed into oxalic acid and ammonia by boiling it with caustic alkali. The former unites with the alkali used, while the ammonia passes over, and may be collected as liquid ammonia; the oxalic acid thus generated may be obtained as oxalate of potash, if potash be the alkali employed, or as oxalic acid if baryta be used, by decomposing the latter oxalate by means of sulphuric acid. In this case, the oxalate of baryta may be treated in the way previously described for oxalate of lead.

As regards these various methods of obtaining oxalic acid, their employment will of course always be a question of *£ s. d.*, the economy of many operations of manufacturing chemistry being often dependent upon their adaptation to the requirements or purposes of particular manufacturers, in connection with other branches of manufacture carried on by them.

The low price at which treacle and sugar are now obtainable, is much in favour of their use in this manufacture. The chief point, however, to which attention must be directed, in order to lessen the cost of production of this article, is in economizing the nitric acid used.

In speaking of the action of nitric acid upon sugar, it was observed that carbonic acid is produced, and that it passes off with the deutoxide of nitrogen also set at liberty. The presence of carbonic acid, in this case, proves a great obstacle in the reconversion of nitric oxide into nitric acid, preventing the union of the oxygen of the air with the nitric oxide. Various processes have been from time to time suggested to effect this economy in the manufacture of oxalic acid; amongst these, the following may more particularly be noticed:—

In 1846, Mr. Jullion patented a method of converting the oxides of nitrogen, given off in the manufacture of oxalic acid, into nitrous and nitric acids. For this purpose, he uses a "generating vessel," which is a vessel something like a Woulf's bottle, only having a moveable top fitting air-tight, and capable of holding about 100 gallons. The materials to form the oxalic acid are introduced, and the vessel heated by a water-bath (by steam or other convenient means), which surrounds the vessel; a quantity of nitric acid is then added, and air or oxygen is forced in through a pipe inserted in the top. The oxygen, coming in contact with the evolved oxides of nitrogen, immediately converts a portion into nitrous and hypo-nitrous acids, which are partly again absorbed by the fluid in the vessel; another portion passes off by a pipe inserted in the upper part of the vessel, which pipe passes through a furnace. This part in the furnace is a little enlarged, and is heated to from 600° to 900° Fah.; this part of the pipe or tube contains spongy platinum, or other similar substances. The gases, on coming in contact with the heated platinum, combine to form nitric acid, which is afterwards condensed in vessels arranged as usual in the manufacture of this acid. Instead of platinum, a close vessel containing water may be used, which decomposes hyponitrous and nitrous acids, giving rise to nitric acid. This principle is applied in the following ways:—The oxides of nitrogen, as evolved from the liquor in the decomposing vessel, coming in contact with oxygen, are converted into hyponitrous and nitrous acids, which, upon being mingled with steam, are decomposed into nitric acid and binoxide of nitrogen; or the introduction of steam may be obviated, by using heated air or oxygen in the decomposing vessels, by which means moisture will be furnished from the liquor; the amount of evaporation thus caused will also prevent an inconvenient increase of the mother-liquor. The compounds thus formed, when passed through suitable condensers, will, if the supply of atmospheric air or oxygen has been in excess, be all or nearly all condensed into nitric acid.

The following is a description of Crane and Jullion's continuous method of manufacturing oxalic acid and nitric acid at one process:—The oxalic acid mother-liquor of a previous process is placed in a closed or covered vessel termed a "generator,"

formed of slate; nitric acid and syrup in the usual proportions employed for such quantity of mother-liquor, are also placed separately in feeding vessels, over the "generator;" heat is then applied to the mother-liquor, and the temperature raised as quickly as possible to 180° or 200° Fahr. Streams of nitric acid and syrup are then caused to flow into the generator by means of suitable stop-cocks and funnel-pipes, in such a quantity that the delivery of the whole shall occupy about eighteen hours, at the expiration of which time the process will be completed.

The gases, arising from the decomposition of the materials so supplied, pass off through an eduction pipe in the top of the generator, into a receiver, into which a stream of chlorine is introduced (from a chlorine generator) sufficient to convert the whole of the oxides of nitrogen into nitric acid. A portion of the water in the receiver is decomposed, its oxygen combining with the oxide of nitrogen to form nitric acid, whilst its hydrogen combines with the chlorine to form hydrochloric acid. These mixed vapours pass over into suitable condensing vessels placed to receive them. The whole of the nitric acid and syrup having been run in, and the liberation of the gases or oxides of nitrogen having ceased, the oxalic acid liquor is drawn off from the generator and crystallized.

Messrs. McDougall and Rawson have also patented a method of recovering the vapours which pass off in the manufacture of oxalic acid. To effect this, they direct the employment of a series of vessels containing water, into the first of which the nitrous gas or fumes are passed, through a tube dipping below the surface of the vessel; air is also admitted, which mixes with the gas bubbling up through the water. Attached to the last vessel of the series is a pneumatic apparatus, by means of which the mixture of nitrous gas and air is drawn through this series of vessels, each containing a tube dipping into the liquid, and another tube or pipe attached to its top to connect it with the next vessel. The nitrous gas thus passing alternately into air and water becomes converted into nitric acid. In this process the following reaction is said to take place:—

On 3, NO_2 being passed into water of the temperature of 100° Fahr., or upwards, 2, $\text{NO}_2 + \text{NO}_2$ result, the 2 NO_2 (i.e.) two atoms of nitric acid remain in solution, whilst the NO_2 , which is an incondensable gas, bubbles through the liquid, and unites with the air in the vessel above the liquid; it immediately takes two atoms of oxygen from the air and becomes NO_4 , which, passing through the liquid, becomes nitric acid and nitrous gas, as before, and thus nearly the whole of the nitrous fumes or gas are reconverted into nitric acid.

In Ecarnot's patented process for recovering the nitric acid, he fills his regenerating vessels with a porous substance, such as pumice-stone, supplying the oxygen by a blowing machine, a flow of steam being brought from a boiler.

ON CHLORINATED HYDROCHLORIC ETHER; A NEW ANÆSTHETIC AGENT.

[In consequence of some inquiries respecting this agent, we have thought it desirable to publish the two following papers, one by M. Mialhe, the other by M. Regnault, which together give a very complete account of this substance.—
ED. PHARM. JOURN.]

1.—ON CHLORINATED HYDROCHLORIC ETHER.

BY M. MIALHE.

DR. ARAN having requested me to supply him with the different volatile agents possessing anæsthetic properties, with a view to his studying more carefully than had previously been done their local sedative action, I gave him at two different times the liquid obtained by the action of chlorine on olefiant gas, which had been furnished by two of the best manufacturers of chemical products in Paris, under the name of "*Dutch liquid*." The first of the specimens thus supplied afforded to Dr. Aran very satisfactory results, which he forthwith published. It was otherwise, however, with the second specimen. I endeavoured to ascertain the cause of these different results, and discovered that the liquid last tried was that alone which possessed the characters of *Dutch liquid*, while that previously used corresponded more nearly with the liquid chloride of carbon, having a greater density and higher boiling point than the true *Dutch liquid*, and being, moreover, unflammable. On pursuing the investigation, I found that this liquid was not the chloride of carbon, but *Dutch*

liquid in which chlorine had been substituted for part of the hydrogen, or, in other words, *chlorinated Dutch liquid*.

The favourable therapeutic results which Dr. Aran has made public, are therefore to be referred to chlorinated Dutch liquid, and not to Dutch liquid, properly so called. But the price at which chlorinated Dutch liquid can be supplied, is too high to admit of its being advantageously introduced as a therapeutic agent, and I proposed, on this account, to substitute an analogous ethereal compound resulting from the action of chlorine on hydrochloric ether.

It has been shown, from the researches of M. V. Regnault, that when chlorine reacts on hydrochloric ether, hydrogen is removed, forming hydrosulphuric acid, and chlorine is substituted, so as to form a series of compounds containing more and more chlorine, which compounds are isomeric with a corresponding series of compounds obtained from olefiant gas. The isomerism is complete, for not only is the elementary composition the same, but also the density of the vapours. The order of the molecular arrangement alone differs, as may be inferred from the chemical reactions of the compounds.

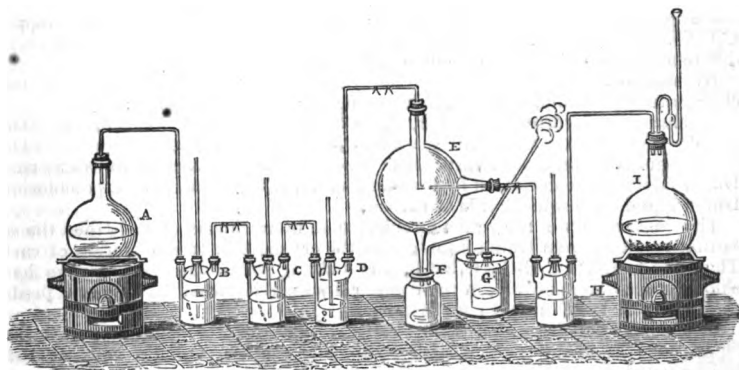
It was thought that these two series of ethereal compounds might be found to possess similar therapeutic properties, and that the chlorinated Dutch liquid, to which reference has been made, might be replaced by the corresponding chlorinated hydrochloric ether. This new compound, with which experiments have been made by Dr. Aran, has been found to be possessed of the same therapeutic virtues as the chlorinated Dutch liquid, and thus my supposition has been completely confirmed.

This compound is colourless, very fluid, having an aromatic ethereal odour similar to that of chloroform, or still better, to that of Dutch liquid. The taste is at once sweet and hot. It has no action on test paper; is very little soluble in water, but dissolves perfectly in alcohol, in sulphuric ether, and in most of the fixed and volatile oils. It is not inflammable, by which it is distinguished from Dutch liquid and the officinal ethers, and nearly assimilated to chloroform. Its density and boiling point are variable, the latter ranging between 110° and 130° Cent., from which it is evident that it is not a homogeneous body, but composed of several ethers varying in density and volatility. As all these chlorinated hydrochloric ethers possess the same anæsthetic properties, and especially as it is difficult completely to separate them one from the other, I propose to call the mixed liquid *chlorinated hydrochloric ether*.—*Repertoire de Pharmacie*.

2.—ON THE ACTION OF CHLORINE ON HYDROCHLORIC ETHER.

BY M. V. REGNAULT.

WHEN placed in a dimly-lighted situation, chlorine remains without action on hydrochloric ether; but under the influence of a powerful light, and still better under the direct influence of the sun's rays, reaction takes place with development of heat; hydrochloric acid is disengaged, and an ethereal liquor is condensed. When a large quantity of this liquor is required to be prepared, the apparatus is to be



Apparatus for preparing Chlorinated Hydrochloric Ether.

arranged as shown in the annexed figure. In the flask, A, alcohol saturated with hydrochloric acid gas is to be placed, or simply a mixture of equal parts of alcohol

and very fuming hydrochloric acid of commerce. The vapour of this liquid is to be passed through a washing bottle, *x*, containing water, then through a second bottle, *c*, containing concentrated sulphuric acid; finally, through a third bottle, *n*, containing water. In the other flask, *z*, peroxide of manganese and hydrochloric acid are to be placed for preparing chlorine, which is to be washed in the water of bottle *x*. The two gases are conducted by two tubes, the orifices of which are opposite each other, into the flask with three openings, *z*; the lower tube of this vessel is fixed in bottle *x*, which is for the purpose of collecting the less volatile portion of the product, the most volatile is condensed in bottle *a*, which should be kept very cold. The flask, *z*, in which the two gases are combined, should be exposed to the sun, at any rate at the commencement of the operation; for, when once the reaction is established, it continues in the shade and does not cease even when daylight is gone. Care must be taken to have an excess of hydrochloric ether in relation to the chlorine, without which precaution the latter would exercise a subsequent action on the first product, and would yield a second more chlorinated. It is difficult, nevertheless, in an operation occupying so much time, to prevent the formation of a small quantity of this second product, unless the operation continued in the shade; but, as it is the least volatile, it almost entirely remains in the first receiving bottle. The liquor is to be washed several times with water, then distilled in a water-bath, on quick-lime, in order to deprive it entirely of water and hydrochloric acid. The first drops which pass over in distillation should be rejected, because they often contain a small quantity of hydrochloric ether in an unaltered state, which has remained in solution; the last quarter is also to be put aside, because it may contain a small quantity of more chlorinated products.

The liquor thus obtained is represented by the formula $C_4H_5Cl_2$; it is *monochlorinated hydrochloric ether*; it has the same composition as Dutch liquid, and resembles it entirely both in odour and flavour. The density of its vapour is also exactly the same 3.42; but the point of ebullition is very different, as monochlorinated hydrochloric ether boils at 64° , whilst Dutch liquid boils at 82.5° Cent. These two substances also differ completely in their chemical reactions; for instance, an alcoholic solution of potash immediately decomposes Dutch liquid in the cold; chloride of potassium is formed, and bicarburetted monochlorinated hydrogen is disengaged C_4HCl_2 . Monochlorinated hydrochloric ether does not show any action of this kind. If this substance be distilled with an alcoholic solution of potash, only a very small portion is changed without the production of bicarburetted monochlorinated hydrogen. Dutch liquid is immediately affected in the cold by potassium, hydrogen is disengaged, chloride of potassium and bicarburetted monochlorinated hydrogen are formed; in hydrochloric ether, on the contrary, the potassium retains its metallic brilliancy. Dutch liquid then differs from the isomeric compound monochlorinated hydrochloric ether, in that one equivalent of hydrogen and one equivalent of chlorine are in combination in quite another state. In the reactions which we have just described, these two elements act as if they existed in the Dutch liquid, in the state of hydrochloric acid, which has been the cause of several Chemists giving the following formula to Dutch liquid:— C_4H_5Cl , HCl , and to monochlorinated hydrochloric ether the formula $C_4H_5Cl_2$; the difference of the chemical reactions is thus completely explained.

By successive actions, under the influence of solar light, of chlorine on monochlorinated hydrochloric ether, the following products are obtained:—

Bichlorinated hydrochloric ether, $C_4H_5Cl_2$, isomeric with monochlorinated Dutch liquid—trichlorinated hydrochloric ether, $C_4H_5Cl_3$, isomeric with bichlorinated Dutch liquid—quadrichlorinated hydrochloric ether, $C_4H_5Cl_4$, isomeric with trichlorinated Dutch liquid—perchlorinated hydrochloric ether, C_4Cl_5 , identical with perchlorinated Dutch liquid, or sesquichloride of carbon.

The final product of the action of chlorine on hydrochloric ether is then the same as that resulting from Dutch liquid; it is the crystallized sesquichloride of carbon. The three products $C_4H_5Cl_2$, $C_4H_5Cl_3$, and $C_4H_5Cl_4$, which are derived from hydrochloric ether, differ entirely, in their physical properties, from the isomeric products obtained from Dutch liquid; for instance,—

Bichlorinated hydrochloric ether, $C_4H_5Cl_2$, boils at 75° —monochlorinated Dutch liquid boils at 115° —trichlorinated hydrochloric ether, $C_4H_5Cl_3$, boils at 102° —bichlorinated Dutch liquid boils at 135° —quadrichlorinated hydrochloric ether, $C_4H_5Cl_4$, boils at 146° —trichlorinated Dutch liquid boils at 153° .

The last product, sesquichloride of carbon, is common to the two series; it boils at a temperature of 180° . The difference in the temperatures of ebullition of the

isomeric chlorinated products of hydrochloric ether and Dutch liquid become less and less as the quantity of chlorine substituted for hydrogen increases. At last the difference ceases in the perchlorinated products, which are identical: thus,—

Between monochlorinated hydrochloric ether and Dutch liquid the difference of ebullition is 38°—between bichlorinated hydrochloric ether and Dutch liquid the difference of ebullition is 40°—between trichlorinated hydrochloric ether and Dutch liquid the difference of ebullition is 33°—between quadrichlorinated hydrochloric ether and Dutch liquid the difference of ebullition is 7°—finally, between the identical perchlorinated products the difference is necessarily 0°.

NEW LEBANON: ITS PHYSIC GARDENS AND THEIR PRODUCTS.

In the last number,* in speaking of the establishment of the Messrs. Tilden, we promised a further communication on the same subject, but in its relations to the United Society, or people called "Shakers," residing in the same valley. During our short visit we received a hearty welcome from Mr. Edward Fowler and his friends, that caused us to regret our inability to accept their kindly offered hospitality, and to examine more closely than the time permitted, their gardens and their arrangements for drying and packing herbs and for making extracts.

The chief tract of land occupied by the "Society" lies on the right-hand side of the valley in approaching the village of New Lebanon, the residences, factories, and public buildings of the Society occupying a plateau elevated perhaps two hundred feet above the high road. As their policy is directly cumulative, their lands occupy a large portion of the most valuable soil of the neighbourhood, and many excellent lots and fields in the village and other parts of the valley, amounting, if we rightly remember, to near seven thousand acres. This large extent is by no means devoted to medicinal plants, the culture of these forming but one branch of the operations of this industrious people, whilst agriculture and several manufactures are equally carried on. "It is about fifty years," says Mr. Fowler, "since our Society first originated as a trade in this country, the business of cultivating and preparing medicinal plants for the supply and convenience of Apothecaries and Druggists, and for about twenty years conducted it on a limited scale. Some thirty years since Drs. E. Harlow and G. K. Laurence, of our Society, the latter an excellent botanist, gave their attention to the business, and induced a more systematic arrangement, and scientific manner of conducting it, especially as to the seasons for collection, varieties, and method of preparation. Since their time the business has rapidly increased, and especially so within the last ten years. We believe the quantity of botanical remedies used in this country, particularly of indigenous plants, has doubled in less than that time.

"There are now probably occupied as physic gardens in the different branches of our Society nearly two hundred acres,† of which, about fifty are at our village. As we find a variety of soils are necessary to the perfect production of the different plants, we have taken advantage of our farms and distributed our gardens accordingly. *Hyoscyamus*, *belladonna*, *taraxacum*, *aconite*, *poppies*, *lettuce*, *sage*, *summer savory*, *marjorum*, *dock*, *burdock*, *valerian*, and *horehound* occupy a large portion of the ground; and about fifty minor varieties are cultivated in addition, as *rue*, *borage*, *carduus*, *hyssop*, *marsh-mallow*, *feverfew*, *pennyroyal*, &c. Of indigenous plants we collect about two hundred varieties, and purchase from the south and west and from Europe some thirty or forty others, many of which are not recognized in the *Pharmacopœia* or the dispensaries, but which are called for in domestic practice and abundantly used."

The drying and storing of so many plants requires much space, and several buildings are occupied wholly or in part for this purpose; the principal and central one of which is a neat structure about 120 feet long by 38 feet wide, two stories high, with a well lighted basement and airy garret. The basement is devoted to the pressing, grinding, and other heavy work, whilst at one end the steam boiler is placed. The first story is used for packing, papering, sorting, printing, and storing the products, whilst the second story and loft are used exclusively for drying and storing. Being well lighted and airy, these rooms are well fitted for the purpose. Racks of hurdles are conveniently arranged along the centre, on which the herbs previously garbled are placed to dry, which is rapidly accomplished by the free

* *Pharm. Journ.* for January, 1852, page 323.

† This number probably includes the settlements of Shakers in New Hampshire, Ohio, and Western New York.

circulation of air that is maintained throughout. The sides of the second story room are arranged with large and tight bins, in which the plants are put as soon as they are properly desiccated, until removed for pressing.

Some plants which are very succulent or viscid, and which are difficult to properly cure, as conium, hyoscyamus, and garden celendine, are desiccated in a drying-room constructed for the purpose, where a temperature of about 115° Fahr. is maintained. Most of the roots are dried in this way after being sliced.

The Society have three double presses in constant operation, and occasionally use two others. Each of these is capable of pressing 100 lbs. daily, although of some kinds of material which require but little time "to set," three times this quantity can be packed.

We were shown into the evaporating-room, where the vacuum apparatus is stationed. This consists of a globular copper vessel, supported on cast-iron columns attached to the floor, about the size of an ordinary sugar vacuum pan. The bottom is jacketed for applying steam heat, whilst there is an interior false top extending from the sides up nearly to the man-hole at top, which prevents the vapour which may condense on the interior of the proper top from falling back into the bowl of the evaporator. They at present have no steam-engine, but use a peculiar arrangement for exhausting the air from the pan, which consists in attaching the condensing vessel to a vertical tube thirty or forty feet high, in which a column of water is constantly and rapidly descending, the effect of which is to produce a constant suction, of sufficient force to keep the evaporator sufficiently exhausted. As the apparatus was not in operation during our visit, we had no opportunity of observing the condition of the barometer gauge. The water used for this purpose is derived from a small dam fed by mountain springs in the higher portion of their demesne.

In our last communication we stated, what we believed to be true, that the "Society" had adopted the vacuum-pan in their extract manufacture to compete with their neighbours Messrs. Tilden, who, we believe, preceded them in its employment, not intending to infer that they would not have adopted it had the idea been suggested in any other way, as appears to have been understood by Mr. Fowler and his friends, who feel themselves called upon to "deny the insinuation that *no other* motive was sufficient to induce the improvement; as not a member of our community had the least knowledge that medical extracts had ever been manufactured in America by that process at the time our apparatus was built. We knew that the imported extracts were generally esteemed as superior to many if not all the American, and feeling desirous of having our articles *right*, we adopted the vacuum-pan as a necessary item by the recommendation of several members of the New York College of Pharmacy, whom we consulted on the occasion."

Mr. Fowler informs us that the amount of extracts manufactured at their establishment annually was about six or eight thousand pounds, but since their improvements in apparatus and manipulations, this amount has been greatly increased and the quality improved. Extract of taraxacum is in the greatest demand, their product in this article amounting the past year to 3700 pounds. Conium, hyoscyamus, and belladonna class next. They do not cultivate conium, but collect that of spontaneous growth, believing it to be more active. Belladonna and hyoscyamus, especially the latter, requires a rich deep soil and abundance of strong animal manure. They find henbane a very precarious crop, as when young it is almost impossible to keep it from being destroyed by insects; and some years they have entirely lost it, notwithstanding their best endeavours to protect it. The biennial variety of henbane is alone cultivated, and when not destroyed by insects, &c., has, under the most favourable circumstances, yielded at the rate of 1300 pounds of good extract from an acre of plants.

Some inquiries relative to the consumption of such large quantities of extracts, induce us to believe that by far the larger portion of them are used in the preparation of secret medicines. An agency in this city sold as much as 1200 pounds of extract of dandelion to one quack medicine vendor, doubtless the proprietor of some extraordinary anti-dyspeptic elixir, or liver pills.—*American Journal of Pharmacy.*

EXPERIMENTS ON THE SEED-CAPSULE OF THE PAPAVER SOMNIFERUM.

BY A. BUCHNER, SENIOR.

A TREATISE has been published by Buchner upon the properties of poppy-heads. Upwards of forty-four years ago he had made the observation, that from three to four drachms of the ripe and dried poppy-head possessed an appreciable narcotic

nfluence. Subsequently,* the researches of Pilloy, L. F. Winckler, and Merk, have shown that of the seed separated from the capsule, one thousand parts contain one grain of alkaloid, although the nature of this alkaloid has not been determined.

By a comparison of modern with ancient literature, Buchner has found that the unripe poppy-head was first employed in medicine in more recent times; and he has himself been several years engaged in comparing the efficacy of the ripe and of the unripe poppy-head. He had, more than twenty years ago, made the observation, that a milky juice trickles down from incision made in the green, unripe capsules, on a warm summer's day, and which, like the dried capsule, possesses a sweetish, mucilaginous taste, leaving behind it a slightly bitter flavour; that, on the contrary, the seeds separated from the ripe capsule impart a mawkish, bitter taste from the first, when masticated. It was hence inferred by him, that the ripe poppy-head possesses greater activity than the unripe. Buchner's experiments have been confined to the brown-seeded, single, or double, garden poppy—*Papaver somniferum*.

The unripe poppy-heads, upon which the author experimentalized, were such as had been cut off about eight or ten days after the fall of the petals, in the beginning of the month of July, and, to retard as much as possible the exudation of their milky juices, had been placed on their stigmata, in a wire sieve, and dried in the shade by the sun's warmth. 100 parts of the lactiferous poppy-head consisted of 13.54 solid matters, and 86.46 water.

The ripe poppy-heads were gathered in the month of August, a fortnight after the opening of the apertures at the junction of the sutures; they were then about the size of small walnuts. The seeds were separated and dried in the shade.

A watery extract was made from a similar quantity of each of these kinds of poppy-heads: the extracts were brought to the consistence of a pill-mass, and then treated with spirit of wine. The soluble and the insoluble matters obtained by this solvent from each variety of poppy-head were compared with each other.

The inspissated alcoholic extract obtained from the refuse of the preparation of the aqueous extract was easily and perfectly soluble in water; and with reference to the bitter flavour, they were scarcely distinguishable one from the other. Litmus was reddened by both. Ammonia, after several days' digestion, at rest, did not produce turbidity. Carbonate of soda behaved in the same manner. Tannic acid caused a golden yellow-coloured flocculent precipitate, more abundantly in the extract made from the unripe poppy-heads.

Nitro-picric acid, which was not rendered turbid by dilution with distilled water, gave, with the extract of the unripe poppy-head, a rich, bright, yellow precipitate; also the same, but in much smaller quantity, with the ripe poppy-head. A tolerably striking difference was exhibited by the action of chloride of gold with the extract of the unripe poppy-head; for instance, it gave a yellow precipitate in considerable quantity, which became grey, while the fluid became covered with a gold-coloured film. In the extract of ripe poppy-head a yellow precipitate was likewise produced, apparently in scanty proportion, which subsequently became first darker, and then, instead of a grey, turned of a brown colour, without the appearance of the yellow film on the surface of the liquid. Chloride of mercury produced no change in the aspect of either fluid. A solution of iodine in iodide of potassium produced, with both extracts, a thick, brown precipitate, which long remained suspended in the fluid. A striking difference was now exhibited, by raising the temperature of the solutions of these extracts to 75°; that of the unripe poppy-head became perfectly clear, while the brown precipitate, in that of the ripe poppy-head, became only very slightly changed, and at first appeared darker than that from the other extract. With chloride of iron the extract of the unripe heads became of a light-reddish brown, the extract of the ripe, a yellow-brown.

The author then diluted an aqueous infusion of opium, until ammonia and carbonate of soda produced no further turbidity, and then compared this with the two preceding. Tannic acid caused a more copious precipitate in the infusion of opium than from the extract of the unripe poppy. Nitro-picric acid produced a similar yellow precipitate with that of the ripe poppy. The yellow precipitate from chloride of gold turned grey earlier than with the unripe poppy-head. In the opiate infusion, chloride of mercury caused a feeble white turbidity. With a solution of iodine in iodide of potassium, a dark brown precipitate was thrown down, and which, as in the extract of the unripe poppy, was partially redissolved by warmth. The chloride of iron changed the colour of the opiate infusion to cherry-red.

The chief points of difference among these three infusions were exhibited in relation to the effects of chloride of gold, chloride of iron, and iodine. It seemed

probable to the author, that meconate of morphia is present in the unripe poppy-head, cautiously gathered eight or ten days after the fall of the petals, and very carefully dried, so that the least possible quantity of their milky juices should be lost; while, on the contrary, by the ripening of the capsule and the consequent desiccation of the milky juices, a change occurs in the condition of the base and acid, so that the alkaloid in the ripe poppy-head is combined with the aqueous solution of certain vegetable acids, exhibiting narcotic properties, and is no longer in the state of a meconate.

Buchner next made infusions of equal quantities of ripe and unripe poppy-heads, and added to it a solution of one eq. of iodine and one eq. of iodide of potassium, and then collected the precipitate. The proportion of precipitate obtained from the unripe, was to that from the ripe poppy in the relation of 100 to 258.

The author has arrived at the following conclusions from his experiments:

1. The unripe does not surpass the ripe poppy-head in medicinal activity.
2. The unripe poppy-heads lose the greater part of their bitter milky juices by excision from the stalks, so that after drying they possess only a sweetish mucilaginous, very slightly bitter taste, and by maceration in water yield an extract containing much mucilaginous and pectinaceous matters.
3. If in gathering the heads a very small quantity of the milky juices is lost, the unripe poppy-heads contain only a small quantity of meconate of morphia.
4. The ripe poppy-heads contain smaller quantities than the unripe of substances soluble in water or alcohol; their infusion is less mucilaginous or sweetish saline; it furnishes a thinner fluid and has a much stronger flavour of opium; it appears to contain meconate of morphia and other salts of the alkaloid, which impart to it a soothing, sedative, or narcotic influence, but in much less degree than is possessed by opium.
5. The proportions of the alkaloid in the unripe and ripe heads are relatively 100 to 258.
6. The ripe poppy-heads are superior to the unripe; and Winckler's proposal that an extract thereof should be substituted for opium, has been proved by Dr. Engerer and other Physicians to be deserving a careful chemical investigation. This extract should be prepared from the ripe poppy-head, freed from seeds and bruised to a coarse powder, then macerated in water, evaporated to a homogeneous consistence, washed in alcohol, and after the alcohol has been the greater part removed, evaporated in a vapour-bath to the consistence of crude opium.—*Buchner's Repertorium*, vol. viii.

ON THE MANNER OF THE PROPAGATION OF COLCHICUM AUTUMNALE.

BY DR. J. M. MACLAGAN.

THE manner of the propagation of *Colchicum autumnale* is interesting, not merely in a botanical point of view, but also as regards the medicinal qualities of the corm or bulb at different periods of its growth.

It is well known to be capable of being propagated in two different ways—namely, by seeds and bulbs. Dr. Christison,* however, has mentioned a third—viz., the throwing off of a number of small immature bulbs from the parent plant. The manner in which perfect plants grow from seeds and immature bulbs has not been determined. It has not, indeed, been accurately ascertained if these immature bulbs ever produced perfect plants at all; but it seems probable that their immature separation from the parent renders them incapable of coming to perfection, and they are perhaps to be regarded more as a kind of abortion than as the fruits of a legitimate mode of propagation.

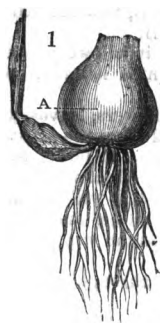
I have endeavoured to trace the growth of the plant from seeds, but in vain. The colchicum in Scotland rarely produces fruit, and never ripens its seeds. I have never succeeded in attempts to grow any of the seeds procured from the Druggists' shops.

The propagation of the plant, by its more ordinary method of forming a single new bulb, has been better ascertained; and, in order to enable the growth of a single bulb to be traced from its origin to its termination, I shall in my description refer to the accompanying figures, where the individual bulbs are lettered, and can be easily followed through all the stages of their progress.

* Dispensatory.

We shall suppose the time at which the observation is commenced to be June, and

FIRST YEAR.



June.



July.



September.

that we have in view a nearly full-sized bulb, which we shall call A. At this time it is as large as an apricot, firm, amylaceous, and extremely bitter, and having attached to it the shrivelled remains of the old bulb, and the leaves, now yellow and decayed.

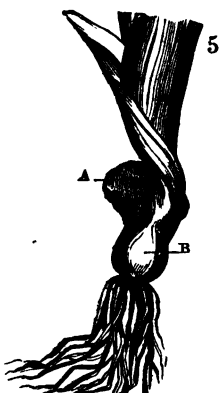
At the end of June, or commencement of July, a small bulb will be observed to have become developed upon the side of the corm A, at its lower part. This small bulb we shall call B. At this time it is a little larger than a grain of wheat, and lies in a small fissure on the side of the parent bulb, a little above the origin of the radicles. It increases slowly and gradually in size till the beginning of August, when it appears as a mere dilatation of the flower-stalk, which it then commences to put up.

In September the flower is in full perfection, the long tube of the perianth of which, has raised the six-partite limb to the height of from six to eight inches above the ground. The flower remains for two or three weeks, and then dies down; and nothing of the plant is seen above the surface till the beginning of February, when the leaf-stalk commences to rise.

SECOND YEAR.



February.



April.

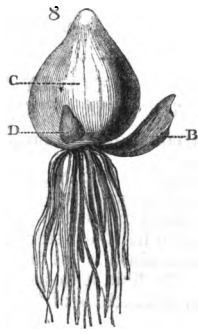


June.

THIRD YEAR.



May.



July.

If at this time the plant be taken up, A and B will still be found to be united, but B will be observed to have increased little in size since Autumn, being but still hardly larger in diameter than the leaf-stalk.

The bulb B thus grows little during the Autumn, but in Winter it increases rapidly in size; in April it is like a large hazel-nut, and from that time it increases still more, till the end of June or beginning of July, when it is, as Dr. Christison states, as large as an apricot.

In April the leaf-stalk is found perfected by a fine group of dark green leaves, generally three in number, and having within their sheath the capsules which ought to ripen their fruit in the course of the Summer.

In May the old bulb will be found dry and withered, and with very little starch; and in July, if the plant be taken up, three bulbs will be found,—A, now reduced to the form of a membrane, bearing no resemblance to a bulb at all; B, now arrived at full growth; and a new member of the series, C, the progeny of B.

This third bulb, C, it is unnecessary for us to trace further; it follows a course precisely similar to that through which B has passed, and which has just been described.

The history is now complete, so far as regards the rotation of flowers, leaves, and fruits; but the lifetime of B has not yet expired; for if we take up the plant in May of the third year, we still find the shrivelled remains of B, and C large, firm, and amylaceous, now bearing leaves, having flowered during the previous autumn. We may go on still further, and if in July the plant be examined, B will be found to have almost disappeared; C large, amylaceous, and extremely bitter, and at its base a new bulb, D, of very minute size, which in the ensuing autumn will produce the flower.

Thus we have traced the growth of *Colchicum* from its infancy, through maturity, to decay.

It must be evident, from the foregoing observations, that the plant is essentially biennial, but it has been thought by some to be triennial. "It sees a part of three successive years, but only outlives two revolutions of each season." (Christison).

Of peculiarities in the growth of *Colchicum*, I may mention one, which has struck me forcibly on account of its frequent occurrence.

In February and August, instead of one leaf-stalk and one flower-stalk making their appearance at their respective periods, I have often remarked that two have occurred, one on either side of the parent bulb. I believe this to be one of the effects of cultivation, as I have nowhere seen it remarked in descriptions of the plant by botanical authors.

Having observed, in cases where the leaf-stalk was accidentally removed from the parent bulb, that a new bulb was thrown out from the top part of the old one, I made the following experiment, in order to ascertain, if possible, the cause of this peculiarity.

Two bulbs were taken up on 1st November; from these the leaf-stalks and their bulbs were detached, and the parent bulbs replanted. Three weeks afterwards a small leaf-stalk was observed to have been given off from the top part of each bulb; and on another occasion, on which the same experiment was tried, two of these leaf-stalks made their appearance. In both of these instances they were found to proceed from very minute bulbs, not larger than barley-corns.

I believe that there is always one of these adventitious bulbs at the top of each parent bulb, but that they never germinate, where the plants are indigenous, unless the proper leaf-stalk and its bulb be removed. When they do so, however, they always remain attached to the parent bulb, and are perfected in much the same time as the normal bulb of the leaf-stalk.

Dr. Christison has mentioned that the full size of a *Colchicum* bulb is that of a small apricot. This I believe to be perfectly correct, in places where the plants are indigenous; but I have frequently procured specimens from the Botanic Garden here, where they were cultivated for the purpose of examination, of the size of large apples; and in October, 1849, I procured one which weighed nine-and-a-half ounces.—*Monthly Journal of Medical Science*, Dec., 1851.

ON THE ANALYSIS OF OPIUM, ESPECIALLY WITH REFERENCE TO THE PROPORTION OF MORPHIA CONTAINED THEREIN.

BY DR. RIEGEL, OF CARLSRUHE.

THE author in the first place enumerates the various methods of analysis which have been followed by several authorities, and then states, as the result of his own investigation and examination of these processes, that he prefers Guillemond's method, with some modification, which he thus describes:—

Half an ounce of the opium to be examined is cut into small pieces and bruised in a mortar with spirit of alcohol at 71°; the fluid is then expressed through linen, and the refuse washed with from ten to twelve drachms of the same alcohol; the alcoholic

solution is then to be filtered into a glass containing one drachm of spirits of ammonia. In twelve hours' time, all the morphia, with some narcotin and meconate of ammonia, will have become deposited. The separation of the gritty crystals of morphia, which adhere to the sides of the vessel from the light, pointed crystals of narcotin, which, for the most part float in the fluid, is to be effected by decantation, according to Guillemond, but this plan does not leave the morphia free from narcotin. In order effectually to separate the narcotin, the adhering meconate of ammonia must be removed by washing in water, and then shaking the crystals in pure ether, or better still in chloroform, by which the narcotin is readily dissolved, while the morphia remains entirely insoluble. After this treatment, the morphia is left behind in rather large gritty crystals, slightly discoloured. This process may be varied by employing boiling alcohol and powdered opium, and adding the solution, still hot, to the solution of ammonia. According to Guillemond, fifteen grammes of opium should yield at least 1.25 grammes or 8.33 per cent. Reich estimates ten per cent., and others twelve per cent. The author gives the percentage of morphia which is obtained by the various processes of different experimenters, and states that the largest proportion (13.50 per cent.) is procured by the modification of Guillemond's method, now described, which he also considers the simplest and most certain for ascertaining the proportion of morphia.

The following process is recommended by Dr. Riegel for the detection of small quantities of opium. To the suspected substance, some potash is to be added, and then shaken with ether. A strip of white blotting paper is to be moistened with the solution, several times repeated. When dry, the paper is then to be moistened with muriatic acid, and exposed to the steam of hot water; if opium be present, the paper will be more or less coloured red.—*Jahrbuch für praktische Pharmacie*, Oct. and Nov., 1851.

EXAMINATION OF THE SEED AND CAPSULES OF DIGITALIS PURPUREA.

BY DR. A. BUCHNER, SEN.

THE author has examined the seed and capsules of *Digitalis purpurea*. The seed lost by drying at about 162° Fahr., 9.26 per cent. of water. The capsules are very slightly hygroscopic, and lose scarcely four per cent. by drying. The author prepared extracts of the seed and of the capsules with ether and water, and examined them. The following are the results arrived at:—

The seeds of *Digitalis purpurea* are preferable to the leaves, as they contain a larger amount of digitaline, together with a fat oil, are not so liable to be mistaken or collected at a wrong period, and are more easily dried and preserved without experiencing any alteration; in short, more dependence can be placed upon them.

The digitaline in the oily compound, which is easily prepared with ether from the seed, merits every attention in a therapeutical respect, for the seed, or the oily digitaline compound from it, can be easily dispensed, and at a very moderate expense, in various forms, as emulsion, powder, pills, &c.

The seed capsules and calyx of *Digitalis* likewise contain digitaline, but in proportionately far smaller quantity; so that the tannate of digitaline, which can be prepared from the aqueous extracts, is respectively as 3.00 and 0.33 per cent. of the weight of the seed and capsules.

This quantity, separated from the seed by exhaustion with boiling water, does not form the entire amount of digitaline; for, like resinous substances, it is not only soluble in alcohol, but also in oils, and it is partially combined with the fat oil of the seed.

The oil containing the digitaline, which can be extracted by ether, amounts to about forty per cent. of the weight of the seed; it belongs to the siccative oils. Ether extracts, besides the oil, another more resinous digitaline compound, which sinks in water, while the oil floats on the top. A portion of the digitaline compound can be removed from the oil by water.

The tannate of digitaline is soluble in hot water; on cooling, it again separates for the greater part.

Digitaline prevents the fermentation of an aqueous solution of sugar; it must, therefore, be considered as a poison to beer-yeast.—Buchner's *Repert.*, ix., p. 38.

ON THE CORTEX SOYMIÐÆ
(THE BARK OF THE SWIETENIA FEBRIFUGA).

BY ALBRECHT OVERBECK.

THE author has performed a series of experiments, with the view of ascertaining whether any distinct and crystallizable principle or alkaloid can be separated from this bark, but has not succeeded in so doing; an amorphous bitter substance being the only result. This he does not consider that he should be justified in regarding as a principle peculiar to the bark, as he has no means of ascertaining its purity.—*Archiv der Pharmacie*, December, 1851.

ON SPURIOUS RHATANY ROOT.

BY PROFESSOR METTENHEIMER, OF GIESSEN.

THE root of the *Krameria triandra*, R. and P., is one of the exotic drugs, which, generally speaking, is but seldom adulterated. Once lately, the author has found it adulterated by the *Radix Calagula*, an underground root of a Polypodium, growing in Peru, and seldom met with in the German trade. It differs both in chemical and physical characters from rhatany root. The root of the *Krameria Ixiniæ*, L., more closely resembles, and has more frequently been substituted for the genuine rhatany. During the past year, the author has several times met with a spurious rhatany root, the source of which is altogether unknown to him. It has generally a thickness of one or two inches, and a length of four, inches in its principal pieces, or of twelve inches in the secondary twigs, the average being about half an inch in thickness. Compared with the true rhatany, its twigs are smoother and slightly shining, having also deeper furrows and transverse depressions, of an annular form. It has, moreover, as sometimes seen on the true rhatany, wart-like projections, and the twigs and stems have a somewhat undulatory contour. The false rhatany is not so tough, and breaks more easily, with a short fracture. When viewed in bulk, it has a dirty violet red-brown colour. Its bark is thicker and more firmly adherent to the wood: on its inner surface, the bark is lighter coloured, and, when cut with a sharp knife, has a glistening aspect. The centre, when cut through, is of a dull, pale-red colour, and without the dark points generally met with in true rhatany root. The false root has no odour; its taste is more strongly astringent than that of the true root. With chemical reagents, the false root gives generally more abundant precipitates than the true root.—*Jahrbuch für praktische Pharmacie*, Oct. and Nov., 1851.

THE APPLICATION OF ORGANIC CHEMISTRY TO PERFUMERY.

(Artificial Essences of Fruits).

BY DR. A. W. HOFMANN.

THE admirable work of the MM. Cahours, upon the oil of *Gaultheria procumbens*, which has made us acquainted with the nature of this substance of such multifarious use in perfumery, shows that to industry nothing is lost. The admission of the oil of winter-green into the class of compound ethers cannot fail to attract the attention of the makers of articles of perfumery to this extensive class, which, through the increased activity in organic chemistry, is daily augmented. The strikingly fruity odour of many of these ethers did not escape the notice of Chemists, but it was reserved for practice to make the choice, and to discover the conditions under which some of these so closely imitated the aroma of certain fruits, that the belief was almost necessitated that the flavour of these fruits was owing to similar combinations, which would be discovered if the operations could be conducted on a sufficient scale.

The artificial production of aromatic oils, for industrial objects, can only be traced back a few years. Young, however, as this manufacture is, it appears, nevertheless, to have been in the hands of several distillers, by whom a very considerable amount has been produced. Upon this point the jury became fully convinced by their investigation in this department; both in the English and in the French divisions of the EXHIBITION a large selection of these chemical perfumeries was to be found, the comparison of which at the same time with other aromatic preparations was satisfactorily illustrated. Most of these oils are poisonous in small quantities, so that in very few instances can their action be asserted without fresh investigations.

The commonest of these preparations was the *pear-oil* (Birneöl), a favourite fluid, which, by examination, is proved to be an alcoholic solution of acetate of the oxide of amyle. As the author had not sufficient of this satisfactorily to determine its composition by its combustion, he mixed it with potash, by which means fusel oil was immediately liberated, and the acetic acid was separated in the form of a salt of silver, of which 0.3089 grm. gave 0.1994 grm. silver; the percentage of silver in the acetate being, theoretically, 64.68, by experiment 64.55. The acetate of oxide of amyle made according to the usual process (1 part sulphuric acid, 1 part fusel oil, and 2 parts of acetate of potash), presents a strong fruity odour, and by the addition of about six parts of alcohol, yields the flavour of jargonelle pear. Upon closer inquiry of the manufacturers of this substance, the author found that it was produced in very considerable quantities (by some, between fifteen and twenty pounds weekly). In England it is extensively employed in flavouring "pear drops," which have almost superseded the common "barley-sugar drops."

Next to the "pear" oil, figures "*apple oil*," which experiment has shown to be nothing more than a valerianate of oxide of amyl, which yields an unsupportable odour of rotten apples, pervading the laboratory where valerianic acid is produced. If the crude product of distillation be treated with a solution of potash the valerianic acid is removed and the ether is retained, the addition to this of five or six times its volume of alcohol gives off an agreeable odour of apples.

The essence, however, which was observed to be in the greatest abundance was the "*pine-apple oil*," which is simply a butyrate of oxide of ethyle. This composition, like the two preceding, yields its flavour on the addition of alcohol. The butyric ether, which in Germany is added to inferior sorts of rum, for the purpose of imparting a flavour to a peculiar kind of drink (pine-apple ale), is seldom prepared for this purpose from pure butyric acid, but from the saponified acid, and the distillation of the soap with concentrated sulphuric acid and alcohol.* The fluid thus obtained contains other kinds of ether besides butyric ether, but may, without these, be employed in flavouring. The analysis of this ether by means of potash and a salt of silver, gave 0.4404 grm. of salt of silver; 0.2437 silver; the percentage of silver in its butyrate being, theoretically, 55.38; experimentally 55.33.

The so called *Cognac-oil* and *Grape-oil* were contributed to both the English and French departments. They are most frequently employed for giving the *cognac* flavour to brandies. The grape-oil consists of a compound of amyle dissolved in alcohol, then set free by the addition of concentrated sulphuric acid; the oil of sulphate of amyle is then freed from alcohol by washing with water. Analysed by means of a salt of barium 1.2690 grm. of amylsulphate of baryta gave 0.5815 grm. of sulphate of baryta, equal to 45.82 per cent. of sulphate of baryta. According to Cahours, and again, more lately, according to Kekule, the analysis of amyl-sulphate of baryta with two eq. of water contains 49.95 per cent. of sulphate of baryta. It is certainly remarkable, the author observes, that we have here a body, which is most carefully excluded from brandy on account of its intolerable odour, employed again under another form to give it a flavour.

The next object of attention is the *artificial oil of bitter almonds*. When Mitscherlich, in 1834, discovered the *Nitrobenzule*, he did not foresee the great amount in which this body would be found in an Industrial Exhibition. It is true he had observed the remarkable similarity of its odour to that of oil of bitter almonds, but then the only source whence the nitrobenzule could be obtained, viz., from the oil of compressed gases, and the distillation of benzoic acid, were too costly to admit of the idea of its employment as a substitute for oil of bitter almonds. It remained for the author, in 1845, to detect the presence of benzule in the transformation of coal-tar; and in 1849, Mansfield† showed that it could be obtained with facility in considerable quantities from coal-tar. The Great Exhibition has shown that this statement has not been lost sight of. In the French department of perfumery it was met with under the designation of *artificial oil of bitter almonds*, and under the fantastic name of *essence of mirbane*, varieties of the oil which, on examination, were found to be more or less pure nitro-benzule. In London it is used in large quantities. Messrs. Mansfield's simple apparatus for its preparation is thus described:—A large glass worm is used, the upper end of which is bifurcated, and forms two tubes of a funnel shape; into one of these funnels concentrated nitric acid is poured, in the other the

* Vide *Annalen der Chemie und Pharmacie*, xlix., 859.

† Chemical Society's *Quarterly Journal*, i., 244.; *Annalen*, lxi., 162.

benzule is placed (and for this purpose it is not required to be absolutely pure). The two bodies therefore meet at the point of junction of these two tubes, the compound is cooled by its course through the windings of the worm, and requires only to be washed with water or diluted solution of carbonate of soda, and it is then fit for use. Although nitro-benzule has an odour so closely resembling oil of bitter almonds, a difference may be detected by an experienced nose. It is, however, very generally employed in scenting soaps, in confectionary, and for culinary purposes. For the last-named purpose it has the advantage of not containing hydrocyanic acid.

Besides the preceding, many other substances of analogous nature were exhibited, but they were of too complicated characters to be satisfactorily examined in the small quantities to be met with. In many of these essences there was, however, a great similarity of aroma.

The application of organic chemistry to perfumery is yet new. Further investigation of the known, and daily becoming known ethers and etherial compounds, will afford additional information on this subject. A strong aromatic odour may be perceived in the interesting *capril ether*, lately discovered by M. Bouis. The acetate of the capril-oxide possesses a peculiar and intense odour, and will doubtless, when it is procured in larger quantities, be employed as an article of perfumery.—*Annalen der Chemie und Pharmacie*. Band lxxxi., Heft. 1, Jan., 1852.

ON THE COMPOSITION OF RICINOLAMIDE, AND THE PRODUCTION OF CAPRYLIC ALCOHOL.

BY J. BOUIS.

CASTOR OIL, which was submitted to examination by Bussy and Lecanu, has since been investigated by a great number of Chemists, but the subject is far from being exhausted. Some researches on this substance, commenced in 1845 in the laboratory of M. Dumas, and since continued in that of M. Peligot, have furnished me with results which the investigations of Bussy, Tilly, Williamson, Svanberg and Kolmodin, Saalmüller and Playfair render it unnecessary for me to mention. I intend discussing them in a lengthy memoir, together with my own observations.

On describing the formation of margamaride, M. Boullay stated that several oils experienced an analogous metamorphosis by the action of ammonia; but he went no further. I will now proceed to describe the various products to which the action of ammonia on castor oil gives rise.

Castor oil, placed in contact with a solution of ammonia in alcohol, or merely in water, forms a solid compound, which represents the amide of ricinolic acid. This ridicol-amide is solid, white, crystallizes in mammillated groups, melts at 151° F., is insoluble in water, but soluble in alcohol and æther. It burns with a very smoky flame, is not acted upon in the cold by potash, but when heated it liberates ammonia if the potash is very concentrated, and forms ricinolate of potash. This amide is decomposed in the cold by acids being resolved into ricinolic acid and an ammonia salt of the acid employed. Its composition is expressed by the formula $C_{26}H_{50}NO_4$, which represents the ricinolate of ammonia minus the elements of water.

Ricinolic acid, obtained by saponification, is represented by $C_{26}H_{54}O_6$; the analyses of the salts of silver and baryta confirm this composition. The presence of this acid was pointed out by Messrs. Svanberg and Kolmodin in castor oil.

When the amide is saponified by potash, the reaction commences only at the moment when the potash losing its water begins to fuse; a volatile liquid is then disengaged simultaneously with the production of hydrogen. On treating the mass with water and precipitating by hydrochloric acid, a mixture of acids separates on the surface, one of which is liquid and the other solid, which is the sebamic acid discovered by Thénard.

The sebamic acid thus obtained forms white crystalline spangles, and melts at 261° . The analysis of this acid agrees perfectly with the formula $C_{20}H_{38}O_6$, assigned to it by MM. Dumas and Peligot.

From the ricinolic and sebamic acids being always associated in this reaction, it was important to ascertain whether the two acids formed part of the amide, or whether the sebamic acid was produced at the expense of the other. I have found that sebamic acid is a product of decomposition of ricinolic acid. In fact, by distilling

ricinolic acid or ricinolate of potash with highly concentrated solution of potash, there is formed sebate of potash, hydrogen, and the volatile oil described below.

Hitherto sebatic acid has been prepared by the distillation of oleic acid, or of certain fatty bodies containing oleine. This operation, which is a most unpleasant one on account of the odour, yields moreover the sebatic acid in very small quantity. Its preparation from ricinolamide would require too much time, as this takes from two to three months to be well formed. I then tried to obtain it directly by treating the castor oil with very strong potash, and the experiment proved perfectly successful.

In this process the disagreeable odour resulting from the decomposition of fatty bodies is replaced by the pleasant and aromatic odour of the volatile oil which is formed. In an industrial point of view sebatic acid may meet with some useful applications if it can be produced at a low price, of which I have no doubt. Its high melting-point and ready combustion will certainly allow of its being associated with more fusible substances for the manufacture of candles.

The proportion of volatile appears to be constant. Several experiments repeated upon various quantities of castor oil of different origin constantly furnished a fifth in weight of volatile oil.

This volatile oil forms a transparent oily liquid, which stains paper like the essential oils, is insoluble in water, soluble in alcohol, ether, and acetic acid. It has an agreeable aromatic odour, and burns with a very beautiful white light. Its specific gravity is 0.823 at 66°; at 356° it boils without decomposition. Its composition agrees with the formula $C_{18}H_{18}O_2$. The theoretical density of the vapour is 4.49; experiment yielded 4.50 = 4 vols.

Sulphuric acid dissolves the oil, and yields crystalline salts of lime and baryta soluble in water. On the application of heat, sulphuric acid converts it into carburet of hydrogen, isomeric with olefant and amelyne. The carburetted hydrogen is very mobile, lighter than water, burns with a very beautiful flame, and boils at 257° without decomposition. Its composition is represented by $C_{18}H_{18}$. The theoretical density of its vapour is 3.26; experiment gave 3.90 = 4 vols.

Fuse chloride of zinc gives rise to the production of several isomeric hydrocarbons, varying among themselves by their state of condensation; but the one most abundant and the most volatile boils at 257°, and possesses the same properties as that obtained with sulphuric acid. The density of its vapour was found to be 3.82 = 4 vols.

Chloride of calcium dissolves in the volatile oil, and furnishes very beautiful transparent crystals, which are decomposed by the action of heat or by the addition of water into the chloride of calcium and volatile oil. The compound is less soluble in the cold than when warmed.

The action of nitric acid varies according to its strength; with dilute acid I converted the whole of the volatile oil into a volatile liquid acid, but the continued action of the acid produced pimelic, lipic, succinic and butyric acids.

Acetic and hydrochloric acids convert the oil into ethers, possessing a highly aromatic fruity odour. The ethers are decomposed by potash into the volatile oil and a salt of the corresponding acid employed.

Caustic lime at a high temperature decomposes the oil into hydrogen and gaseous hydrocarbons. Potash-lime and soda-lime have no action upon the oil at 482°; but above that temperature very pure hydrogen is disengaged, and a volatile acid is formed, which remains in combination with the potash.

These facts evidently prove that the oil belongs to the class of alcohols; it is the caprylic alcohol, $C_{18}H_{18}O_2$, and takes its place in the following series between the amylic and the æthalic alcohols:—

- $C_2H_4O_2$, methylic alcohol.
- $C_4H_6O_2$, vinic alcohol,
- $C_{10}H_{12}O_2$, amylic alcohol.
- $C_{16}H_{18}O_2$, caprylic alcohol.
- $C_{22}H_{24}O_2$, æthalic alcohol.

The way in which caprylic alcohol is formed will be seen by the following equation:—



Ricinolic acid.

Sebate of potash.

Caprylic alcohol.

Comptes Rendus, August 11, 1851.

ON DONARIUM, A RECENTLY DISCOVERED METAL.

BY DR. C. BERGMANN.

DR. BERGMANN received by Mr. Krantz a mineral from Brevig, in Norway, which is found in the same Zircon-syenite that contains Wöhlerite and Enkolite, and he discovered in it the oxide of a new metal combined with silicic acid. This metal he calls *Donarium*, after the god Donar, and he assigns to it the symbol *Do*.

The *silicate of the oxide of donarium*, $\text{Do}_2 \text{O}_3, \text{Si O}_3 + 2 \text{HO}$, is yellowish-red, in some fragments passing into brown, in others into yellow; when scratched or powdered, it is light orange. In thin films it is almost transparent, the thicker ones translucent. Some pieces have a distinctly laminated structure, in others the fracture is more flat, or conchoidal. Its hardness is between that of fluor spar and apatite; its spec. grav. = 5.397.

Small films heated in a platina spoon break down into a dark-brown mass, which reassumes an orange colour when cold; the larger pieces lose their transparency. By heating it in a glass tube, watery vapour is driven off. Fragments held by the platina forceps in the flame of a spirit lamp, decrepitate. Heated by the blow-pipe on charcoal, it does not melt, a slight vitrification being sometimes observed on the edges, perhaps in consequence of the intermixture of some foreign substance. Fused with soda, the silicic acid is dissolved. The other constituents are seen in the non-transparent mass, by the help of a glass, as small yellow particles. Borax yields a yellow bead, which is colourless when cold. The phosphates produce in the external part of the flame a reddish glass, which is colourless when cold; in the inner part of the flame the bead becomes yellow, and when cold is colourless.

The mineral is readily and completely decomposed by acids, and yields, when treated by hydrochloric acid, a clear and transparent gelatinous matter. At the same time some carbonic acid is evolved. The colour of the solution is deep yellow, like that of a concentrated solution of iron. The mineral is also affected by diluted acids, even by tartaric acid. After having been exposed to a strong heat, the essential parts of the mineral are no longer acted upon even by concentrated acids.

The analysis showed the presence of lime, water, and the new oxide; also some traces of magnesia, manganese, carbonate of soda, and iron.

The oxide of donarium belongs to the class of earthy bodies, and ranks next to zirconia and yttria. The hydrate, which is thrown down by ammonia of a beautiful white colour, becomes yellow, and at last yellowish-red, losing its hydrate water in the air. By heat the latter is completely removed, and the oxide, which is insoluble in muriatic acid, can be perfectly deprived by this acid of the contained iron. The analysis showed the constituents to be:—

Silicic acid	17.695
Oxide of donarium	71.247
Carbonate of lime.....	4.042
Oxide of iron.....	0.310
Magnesia and oxide of manganese.....	0.214
Potash and a little soda.....	0.303
Water	6.900

100.741

Donarium.—The metal is obtained as a black powder by treating the oxide with potassium. If the alkaline solution be directly poured off and the powder washed with water, it can be kept for from twenty-four to thirty-six hours under water without alteration; but if it remains under hot water, a yellowish-grey mass is gradually formed in consequence of oxidation. The black metallic powder forms heavy flocculi, which soon conglomerate, and are easily separated by filtration. When in the dried state they assume a metallic lustre when rubbed with an agate; and then can be preserved in this condition for several hours, even in a damp atmosphere, without developing any smell. The specific gravity is nearly = 7.35. The powder thrown into a flame burns with a reddish light, and yields the red oxide; so also, if the black powder be heated in a platina spoon, it burns, and, moreover, appears to glow, but only transitorily. Neither cold nor boiling muriatic acid affect the metal; nitric acid acts not when cold, and but slowly when heated; nitro-muriatic acid readily produces the red oxide, of which a small portion is dissolved; by the application of a few drops of sulphuric acid a sulphate is formed,

whilst at the same time the smell of sulphurous acid is perceived. The greyish-yellow substance, produced by potash-water, quickly forms, when heated by itself or moistened with nitric acid, the red oxide. This powder also, when thrown into the flame of a spirit-lamp, glows.

Hydrated Oxide of Donarium.—The precipitate produced by ammonia from the muriatic solution of the mineral is, by long digestion with sulphuric acid, converted into sulphate of the oxide of donarium, and from this the hydrated oxide is precipitated by ammonia. The voluminous precipitate, dried at a common temperature, forms yellow gummy masses, the powder of which is reddish. In this condition this substance represents the pure hydrated oxide, which, like oxide of iron, probably combines with different proportions of water. The water is expelled by a slight increase of temperature. The hydrate is dissolved by all acids at a common temperature, and more so when heated. If muriatic acid be employed, no chlorine is developed.

Oxide of Donarium is obtained by heating the hydrate to redness. Its sp. grav. is 5.576; colour deep red; its form heavy glittering scales. Finely powdered it is orange; darker when strongly heated, and lighter again when cold. Muriatic acid, nitric acid, aqua regia, and even fluoric acid, have no effect upon the oxide which has been heated to redness. By the continued action of concentrated sulphuric acid it is rendered soluble, if it be afterwards mixed with much water. If the oxide, however, be exposed only to that temperature which expels the water from the hydrate, it is slightly acted on by muriatic acid, without the development of chlorine.

The solutions of the hydrated oxide in nitric and sulphuric acids are colourless, but those in hot muriatic acid are yellow; the colour disappears when the solution becomes cold, but can always be reproduced by heat.

Potash throws down the hydrated oxide from the solution of a white colour, and an excess does not redissolve it. After some time the precipitate becomes, by continued washing, somewhat yellow, and shrinks. Even when boiling water is employed the precipitate retains a small portion of the potash. Soda acts like potash.

If the precipitates produced by these two agents be separated by filtration, and the alkaline liquid be again acidulated and mixed with ammonia, a slight turbidity takes place after some time. Ammonia produces a more voluminous precipitate in the solution than potash.

Monocarbonate of potash produces a white precipitate, which becomes yellowish after drying. An excess of the precipitant redissolves the precipitate completely.

Monocarbonate of soda has the same effect.

Bicarbonate of potash throws down a white precipitate, which is redissolved by an excess of potash, and does not reappear when the liquid is boiled.

Bicarbonate of soda acts in the same way.

Carbonate of ammonia also causes a precipitate soluble in an excess of the precipitant. The solution can be kept for a long time without becoming turbid; but if heated it immediately becomes turbid, and when boiled a precipitate is formed which contains the whole oxide of the solution, and which cannot be redissolved when cold, even if the solution contain much carbonate of ammonia after the boiling. The precipitate is not gelatinous, but forms a heavy white powder, which becomes yellow when the boiling is continued, and develops no carbonic acid when moistened with acids after drying. If perfectly washed and dried at 120° a large proportion of ammonia is detected in the precipitate upon the application of the usual tests.

Phosphate of soda produces no precipitate in the acid solution; but if the solution be neutralized by carbonate of potash, a white, gelatinous, transparent mass is precipitated, which is for the most part redissolved by an addition of an alkaline carbonate. The precipitate formed in the neutral solutions is readily redissolved by any acid.

Oxalic acid produces in neutral as well as in acid solutions a white, voluminous precipitate, insoluble in free oxalic acid, but soluble by heat in a large quantity of muriatic acid; when cold the clear liquid becomes again turbid. If the hydrated oxide has been dissolved by carbonate of potash, a precipitate is only produced by a considerable quantity of oxalic acid, as well as by any other acid; but the precipitate is redissolved on an addition of an alkaline carbonate. A concentrated solution of sulphate of potash gradually causes a precipitate in the sulphuric solution, which is counteracted by a large addition of water, or by a small quantity of muriatic acid.

Ferrocyanide of potassium produces in the neutral solution a flesh-coloured precipi-

pitae, inclining to brown, which forms with acids a turbid liquid, which turbidity is also produced by applying the test to the acid solution.

Carbonate of baryta throws down the oxide of donarium from its solutions even in the cold; by boiling, the process is much accelerated. Baryta water produces a white precipitate.

Sulphuret of ammonium produces a dark-green, flocculent precipitate, similar to that of iron, which soon deposits and cannot be re-dissolved by an excess of the precipitant. Alkaline carbonates do not act upon it, but muriatic acid decomposes it with the emission of sulphuretted hydrogen, and this solution is affected by its reagents like the original solution. If the hydrated oxide be dissolved by a carbonated alkali, and sulphuretted hydrogen or sulphuret of ammonium be added, the liquid soon becomes green, without becoming turbid; after a short time, however, the sulphur compound is precipitated.

Ferridecyanide of iron, sulphuretted hydrogen, and tincture of galls, produce no effect on a solution of the oxide of donarium. The presence of non-volatile organic substances, such as tartaric acid, almost entirely prevents the reaction upon pure alkalies, a cloudiness only taking place slowly. If organic colouring matters be present with the oxide in a solution, they are thrown down by alkalies with the hydrate, from which they cannot be separated by washing with water.

If the red oxide be fused with pure or carbonated alkalies, it does not dissolve in them, but is separated from them with its peculiar colour, when the fused mass is treated with water. Also by fusion with alkalies, the oxide is not rendered soluble in acids, although foreign substances can be extracted from it. If fused with bisulphate of potash, and treated with a small quantity of water, a flaky residue is obtained, which is redissolved by a larger quantity of water, especially upon the addition of heat, and also by the addition of muriatic acid.

If fused on charcoal by the blow-pipe, the oxide of donarium remains unchanged in the inner and outer flame. Fused with soda, it forms a ball, in which the individual parts of the oxide are suspended, undissolved, and can be recognized with the aid of a glass, by their red colour, when cold. With borax, a yellowish bead is formed, which becomes colourless when cold, and in which the particles of the oxide can be recognized. The same is the case if fused with phosphates. By heating in a current of hydrogen, the oxide is not perfectly reduced to the metallic state. The red colour of the oxide certainly disappears when heated in hydrogen, and passes into yellowish and grey, but the mass appears only to be a mixture of metal and oxide, or to be a suboxide.

Chloride of Donarium.—By mixing the oxide with sugar, and carbonizing and igniting the mixture in a current of chlorine, the chloride of donarium is obtained, which is distinguished from other chlorides by its volatility. It does not contain the chlorides of glucinum, thorium, or zirconium, and the solution conducted itself like a solution of the pure oxide. By sodium it was easily reduced to the same black powder as the oxide was by potassium. The chlor-compound contained no other related substances.

Oxide of donarium, from the preceding observations, would appear to be most allied to the oxide of zirconium. Its basic nature is less than that of the other earths; and there can be but little doubt that the formula of the oxide is $R_2 O_3$.

Sulphate of the Oxide of Donarium is obtained by evaporating sulphuric acid with the hydrated oxide, till the vapours of sulphuric acid cease to be emitted. The residue is treated with water. The neutral salt appears not to crystallize, and the glittering scales which eliminate from the concentrated solution, appear to be an acid salt. If the sulphate be strongly heated, it is completely decomposed. The residual oxide of donarium now possesses a reddish-yellow colour, which it retains, when cold. The solution of the sulphate, supposed to be neutral, becomes turbid, when boiled, and clear again when cold. If it be again boiled, the precipitate reappears, but this, as well as the re-solution of the precipitate in the cold, takes place now very slowly, and the liquid must ultimately stand several hours, or be mixed with a few drops of water before it again becomes clear.

Analysis of the sulphate.—The salt, assumed to be neutral, was prepared as stated above, and dried for a long time at 110° . It consisted of:

Sulphuric acid	31.236
Oxide of donarium	47.734
Water.....	21.030

100.000

The *nitrate* forms small, star-like, white crystals, which attract moisture from the air, and readily dissolve in water. The solution has an acid reaction, and an unpleasant metallic taste. The salt is readily decomposed by heat, and leaves behind the red oxide.

The *oxalate* is brilliant white, permanent in the air, and contains a large proportion of water. It is decomposed by heat, undergoing a partial fusion, and yielding the red oxide, which, being treated with acid, evolves no carbonic acid. Muriatic acid scarcely affects the residue, but concentrated sulphuric acid acts very readily, and the solution in water shows the relation to the reagents just described.

If the very dry hydrated oxide be decomposed by muriatic acid, a brownish-yellow liquid is obtained, which is almost colourless when cold. After evaporation an uncrystallized hydrated *chloride* remains behind, of a dark yellow colour, striking brown; and after evaporation, has the appearance of a varnish. It attracts moisture from the air without deliquescing. If dried for some time at 150°, it forms scales of a lemon-colour; at a higher temperature it becomes again paler. Water readily and completely dissolves the chlor-compound, and the solution reacts acid. If the dry mass be moistened with water, small white warty crystals are at first formed, which appears to consist of a chloride, but which are speedily dissolved by an addition of water. The hydrated salt does not melt at a temperature which softens glass, and is scarcely at all volatilized. The heated chlor-compound is insoluble in water, and is dissolved with difficulty, even after continued exposure to the action of muriatic acid.

A *carbonate* does not appear to exist.—*Pharm. Central-Blatt*, No. xxxv., 1851, p. 545.

THE CHINESE MATERIA MEDICA.

BY BERTHOLD SEEMANN.

The people of Canton seem to attach great value to the virtues of plants. In the principal streets are stalls where medicinal herbs, roots, barks, and other vegetable substances are sold. At one of these places I counted more than fifty different drugs. There is generally, especially if a cure is performed, a man puffing up and extolling the extraordinary properties of his wares, in doing which he indulges now and then in a piece of witticism, which occasions among his gaping audience great merriment. I have never regretted so much being ignorant of the vernacular tongue as here, for whatever may be the quackery connected with the Chinese practice of medicine, a great deal, no doubt, is sound science, dearly purchased by experience. In this respect we have much to learn from them. The great work of Li-shi-chin, called the 'Pun-tsau-kang-muh,' or *Materia Medica*, is a valuable compilation, of which Europeans know but little, and which has never been translated into any language. It consists of no less than forty closely-printed octavo volumes, and contains several hundred figures of minerals, plants, and animals. True, the representations are imperfect, but they are in most instances not inferior to those woodcuts adorning the pages of the old "Kräuterbücher" and Herbals published in Europe shortly after the invention of printing. To identify the names and figures given by Li-shi-chin with scientific appellations, will be an interesting study to those who occupy themselves with Chinese Natural History, and, judging from the few extracts which have lately been published, the labour of translating the whole would be amply repaid by a vast amount of curious and useful information.*—*Hooker's Journal of Botany*.

PREPARATION OF A NEW COMBUSTIBLE MATERIAL.

M. POFELIN DUCARRE has prepared what he has designated *Paris Coal*, by mixing the refuse of firewood, coal, coal-dust, and fragments of charcoal with coal-tar, grinding the mass together, pressing it in a cylinder, and exposing it to a red heat. The contained mass acquires such solidity that it may be carried from place to place. This coal has been prepared by the inventor during the last five years, and the manufacture has lately been considerably extended.—*Bulletin de la Société de l'Encouragement*, July, 1851; and *Chemisch-Pharmaceutisch Central-Blatt*, Nov., 1851.

* The work in question is to be had of all the principal booksellers in Canton. Price 3 dollars, 50 cents, Spanish.

THE USES OF BENZIN.

ACCORDING to M. Collas, the well-known hydro-carburet Benzin, which is procurable at a slight cost from the products of gas used for the purposes of illumination, serves well for the separation of fatty or resinous matters from dye-stuffs. The applications of nitro-benzin in perfumery have now been for some time known. Its odour is that of oil of bitter almonds.—*Bulletin de la Société de l'Encouragement*, July, 1851; and *Chemisch-Pharmaceutisch Central-Blatt*, Nov. 12, 1851.

IMPORT OF DRUGS, &c., IN 1851.

FROM the annual accounts relating to trade and navigation, presented to the House of Commons on the 17th of February, we find the import of the under-mentioned articles in 1851 was as follows :—

Ashes (pearl and pot), 199,911 cwts.; brimstone, 768,299 cwts.; cochineal, 23,253 cwts.; opium, 106,113 cwts.; quicksilver, 27,370 lbs.; saltpetre and cubic nitre (nitrate of soda), 465,007 cwts.; cassia, 267,582 lbs.; cinnamon, 527,777 lbs.; cloves, 253,437 lbs.; mace, 74,863 lbs.; nutmegs, 358,320 lbs.; pepper, 3,996,496 lbs.; pimento, 14,840 lbs.; turpentine (common), 431,950 cwts. The quantity of opium entered for home consumption was 50,368 lbs.; in 1850 it was 42,324 lbs. The importation of cassia exhibits a very marked falling off from that of last year, when 1,050,008 lbs. were imported. The import of pepper has fallen one-half, having been 8,082,319 lbs. in 1851; the entries for home consumption have, however, been rather more than last year. The importation of cloves has diminished almost two-thirds, and that of cinnamon more than one-fourth. The small importation of quicksilver would lead to the inference that shipments have been made to South America direct from the Mines, instead of *via* England, as in previous years.

A MISTAKE.

A CORRESPONDENT has called our attention to a letter which appeared in the *Lancet*, of 7th February, headed "Rights of Medical Practitioners," from which he quotes the following paragraphs :—

"A Bill is proposed for registering Medical Practitioners; this is a move in the right direction, if it carries out the pains and penalties against illegal practice.

"Chemists and Druggists, under the assumed name of Pharmacutists, propose a Bill, and should it pass, no doubt they will claim being medical practitioners, though ignorant of the different sciences connected with the nature and treatment of disease; and this will constitute another anomaly, of which there are too many in the practice of physic."

(Signed) "W. NIX."

[It is clear that the author of the above paragraph has not read the Pharmacy Bill, but takes his cue from those who are in the habit of conjuring up giants for the purpose of creating a panic. These false alarms are like the cry of "Mad dog," merely raised to excite a run against the Bill.

We repeat, that the Pharmacy Bill is, as its name implies, "An Act to regulate the Qualifications of Pharmaceutical Chemists." It is not like the Apothecaries Act of 1815, "An Act to convert Apothecaries into General Practitioners."—Ed.]

CHEMICAL SOCIETY,

February 2, 1852.

DR. LYON PLAYFAIR IN THE CHAIR.

Papers were read ;—

ON A NEW METHOD OF OBTAINING HIPPURIC ACID IN CONSIDERABLE QUANTITY WITHOUT EVAPORATION OF THE URINE.

BY EDWARD RILEY, F.C.S.,
Assistant in the Museum of Practical Geology.

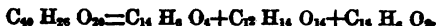
THE method described for obtaining hippuric acid consists in adding to fresh cow's urine some hydrochloric acid, in the proportion of half a fluid ounce to a pint of urine. The hippuric acid being very slightly soluble in this acid, liquor is deposited, together with some colouring matter, from which it is subsequently purified by dissolving it in water with excess of lime, adding animal charcoal, and heating the mixture for half-an-hour or more. On adding hydrochloric acid to the filtered liquor, and allowing the mixture to cool slowly, the hippuric acid is deposited in large pris-

matic crystals. It sometimes requires to be further purified by repeating this process. The acid thus prepared, on being analyzed, gave results agreeing with the established formula for hippuric acid, namely, $C_{10} H_8 N O_5 + HO$.

ON POPULIN.

BY M. FIRIA.

The author describes the result of his investigations of the composition and products of decomposition of the crystalline substance populin, obtained by Braconnot from the leaves and bark of *populus tremula*. He assigns to it the formula $C_{40} H_{28} O_{26} + 4 H O$. On treating this substance with dilute acids it is resolved into benzoic acid, grape sugar, and saliretin, thus—



On boiling a solution of populin with baryta-water, a limpid liquid results, which contains nothing but benzoate of baryta and salicin. Hence populin may be viewed as a conjugate compound of benzoic acid with saligenin and grape sugar; or of benzoic acid with salicin, thus—



or,



The author hopes to succeed in transforming salicin into populin, by submitting the former to the action of chloride of benzoyl.

February 16, 1852.

PROFESSOR DAUBENY, PRESIDENT, IN THE CHAIR.

The President read a paper,

ON THE VARIATION IN THE RELATIVE PROPORTION OF POTASH AND SODA PRESENT IN CERTAIN SAMPLES OF BARLEY GROWN IN PLOTS OF GROUND ARTIFICIALLY IMPREGNATED WITH ONE OR OTHER OF THESE ALKALIES.

The author details some experiments, undertaken by him at the Oxford Botanic Garden, with the view of determining whether the usual quantity of potash and soda existing in barley might be made to vary by causing the plant to grow in soil impregnated with more than the ordinary quantity of one or the other of these alkalies.

He found that when the barley had grown in a soil which had been dressed with a strong solution either of carbonate of soda or of chloride of sodium, the ashes of the plant contained about eight per cent. more soda than was present when the plant had grown in a soil impregnated with carbonate of potash, or left unimpregnated.

This difference may admit of explanation, by supposing one alkali capable of replacing the other within the organism of the plant, but the author thinks it more probable that it arose from the sap circulating through the plant at the time when it was cut, containing in the one case more soda than it did in the other. The saline contents of the fluid of the sap would of course be confounded with those which had been actually assimilated by the plant, and hence, from the variation in its composition, must tend to modify the amount of the alkalies obtained from the ashes of the plant in each instance according to the nature of the material with which the soil had been impregnated.

ON THE COMPOUNDS OF COTTON WITH THE ALKALIES.

BY J. H. GLADSTONE, PH. D.

The author first described the process of Mr. Mercer, by which the beautiful fabrics, made known to the public through the Great Exhibition, are produced. When cotton, or an article made of that material, is immersed in strong caustic soda in the cold, a certain combination is effected—which is again destroyed by pure water; but the "Mercerized" cotton thus produced is permanently contracted, and rendered more susceptible of dyes. This was illustrated by a number of specimens, much shrunk, so that they assumed an appearance of extraordinary fineness, others puckered in patterns by partial Mercerization, and others again printed with colours which surpassed in depth and brilliancy the colours produced by the same means on the calico in its original state. Dr. Gladstone proceeded to detail experiments by which he had succeeded in obtaining the compound of cotton and soda free from adhering alkali, through the agency of strong, sometimes absolute, alcohol. He found that the proportion of soda which combined with the lignine varied with the

strength of the solution employed, but under no circumstances exceeded one atom, the formula of the "sodaed" cotton being $C_{24}H_{20}O_{20}$, NaO. There was a varying amount of combined water. Some properties of this compound were discussed, and the author then proceeded to state his conviction that there was no sufficient ground for viewing the "Mercerized" cotton as chemically different from the original lignine. It is identical in composition, and the change of properties may be accounted for by the change in its physical condition. When viewed under the microscope, the fibres in their ordinary condition appear as flattened twisted ribands; but the moment they are touched by the alkaline ley they untwist themselves, contract in length, and swell out, assuming a rounded solid form; and this circular appearance they retain after the soda is removed by water. This not only explains the shrinking, but the cause of a larger quantity of dye being absorbed as the substance of the fibre itself is porous. Potash has a similar action to that of soda, giving rise to a compound, the formula for which is $C_{24}H_{20}O_{20}$, KO.

HOUSE OF COMMONS, *Thursday, Feb. 12.*

• THE PHARMACY BILL.

MR. JACOB BELL, in pursuance of notice, moved that the House resolve itself into a Committee on the question of granting leave to bring in a Bill to regulate the qualification of Pharmaceutical Chemists.

MR. BELL stated that the Bill was similar to the one which he had brought forward during last Session, but that amendments had been introduced in consequence of objections urged against some of its details. The importance of the subject had been generally admitted, and above 600 Petitions had been presented to the House last year in favour of the Bill. It was not necessary on that occasion to discuss the subject at any length, as he presumed there would be no opposition. He concluded by moving the resolution of which he had given notice.

MR. HUME objected to the introduction of any Bill on the subject. He thought there were quite enough medical bodies already, and that it was useless to create a new corporation of practitioners. It would only be wasting the time of the House to discuss the question. He was not aware whether Her Majesty's Ministers had given their concurrence to the introduction of the measure. If so, he should not oppose it, but in his opinion it was quite unnecessary.

MR. BELL stated, that he had consulted the Secretary of State for the Home Department, who had assented to the introduction of the Bill. He (Mr. Bell) was quite prepared, at the proper time, to answer the arguments which had just been advanced in opposition to the Bill, and he hoped the hon. Member (Mr. Hume) would not oppose it at that early stage.

The House then went into Committee, and it was resolved:

That the Chairman be directed to move the House, that leave be given to bring in a Bill for regulating the Qualifications of Pharmaceutical Chemists.

The resolution having been reported, leave was granted, and the Bill was brought in and read the first time.

Second reading fixed for Wednesday, February 25.

Thursday, Feb. 19.

THE INSPECTION OF MEDICINES IN MERCHANT AND EMIGRANT VESSELS.

MR. J. BELL asked the President of the Board of Trade whether it was in contemplation to appoint inspectors to examine the medicines supplied to merchant vessels, and to emigrant vessels not chartered by Her Majesty's Land and Emigration Commissioners; and whether the new list of medicines for merchant vessels was completed?

MR. LABOUCHERE replied, that he did not exercise the power of appointing inspectors to examine medicines, because the fund placed at the disposal of the Board of Trade by the Mercantile Marine Act would not admit of his doing so; but when it did he should exercise that power. The list of medicines approved by Sir W. Burnett had been sent to various local marine boards for their opinions. Part of the hon. member's question related to emigrant vessels. Those were not under the superintendence of the Board of Trade. His hon. friend the Under-Secretary for the Colonies would be able to answer that question.

MR. J. BELL inquired whether there was no security for proper inspection in regard to merchant vessels?

Mr. LABOUCHERE replied, that the same security existed which was enforced before the Mercantile Marine Act passed. The additional security of inspectors did not exist. There was still, on the part of a sailor who thought himself aggrieved, the power of making application to a magistrate.

NOTICES OF BOOKS.

THE BOOK OF NATURE: an Elementary Introduction to the Natural and Physical Sciences. Second Division. By FRIEDRICH SCHOEDLER, Ph.D. Edited from the fifth German edition by HENRY MEDLOCK, F.C.S. London: J. Griffin & Co., 1851, 8vo, pp. 578.

The second division of Schoedler's work treats of mineralogy, geology, botany, physiology, and zoology. The former division consisting of physics, astronomy, and chemistry. This manual is written with clearness; and subjects, which are often rendered dry and repulsive to the young student, are here made interesting. It is much simplified by copious illustrations, and is a book well adapted to lead the student to more comprehensive works on the different branches of science of which it treats.

HAND-BOOK OF CHEMISTRY. By LEOPOLD GMELIN. Vol. vi., Metals—concluded.—Translated by HENRY WATTS, B.A., F.C.S. London: printed for the Cavendish Society. 8vo, pp. 428.

A COMPENDIUM OF DOMESTIC MEDICINE, and Companion to the Medicine Chest. By JOHN SAVORY, Member of the Society of Apothecaries, London. Fourth Edition. London: John Churchill. 1852.

THE DRUGGISTS' GENERAL RECEIPT BOOK. By HENRY BEASLEY. Second Edition, corrected and improved. London: John Churchill. 1852.

MANUEL LEGAL DES PHARMACIENS, et des Eleves en Pharmacie. Par M. J. B. G. GUIBOURT, Professeur Secrétaire de l'Ecole de Pharmacie de Paris. Small 8vo, pp. 224. Paris: Bailliére.

THE FALLACIES OF HOMOEOPATHY. By C. H. F. ROUTH, M.D., &c. 8vo, pp. 85. London: H. K. Lewis, 15, Gower Street North.

ON THE MODE OF PROPAGATION OF CHOLERA. By JOHN SNOW, M.D. Tyler, Bolt Court.

ON NARCOTISM BY THE INHALATION OF VAPOURS. By JOHN SNOW, M.D. Wilson and Ogilvy, Skinner Street.

TO CORRESPONDENTS.

LONDON MECHANICS' INSTITUTION.—A chemical class has been formed, and on Tuesday, Feb. 17, Mr. C. J. Varley, who is appointed teacher in that branch of science, delivered an introductory lecture on the Elements of Chemistry.

A Correspondent (Saffron Walden) is particularly anxious to know—(1.) Why the usual Pharmaceutical Meeting on January 14th was not held. Several others having asked the same question, we may state, that the Committee which has the superintendence of these meetings, decided not to hold one on that occasion, as there were not at the time the Committee met a supply of papers on hand, and it was thought to be a period of the year unfavourable for a Meeting, in the absence of any especial object of attraction.—(2.) Möhr and Redwood's *Practical Pharmacy*, price 12s. 6d.—(3.) Brande's *Manual*, 45s.

A Member (Brighton).—We are not certain whether glass retorts coated with copper can be procured in London; flasks coated with copper may be had of Mr. Button, Holborn Bars, also of Mr. Edward's, Liverpool, price from 4s. 6d. to 10s. 6d., according to size.

Aleph.—(1.) Syrupus Rosæ. Fresh petals are intended; the colour is pale red.—(2.) Infusion of senna, if made with cold water, should macerate about six hours; some prefer it to that made with hot water.—(3.) Yes, if for domestic use.

Scoticus.—Syrupus Ferri et Quinæ Iodidi. Digest 3j of iodine with 3ss of iron filings, and 3iv of water, with a gentle heat and frequent agitation, till the solution is colourless; filter it rapidly into a vessel containing 3xxviiij of simple syrup. Dissolve also gr. xij of sulphate of quinine in 3ij of water acidulated with sulphuric acid, and add to the former. It contains 3 grs. of iodide of iron in 3j.—Bouchardat.

Amicus.—*The Pharmaceutical Latin Grammar*.

Phœnix.—*Liquid Cochineal*. Vol. x., page 260.

T. O. C.—*Tinct. Lobelia Infl. Ætherea*. R Dried Lobelia in powder, $\frac{3}{4}$ v; Ether, $\frac{1}{2}$ xiv; Rectified Spirit, $\frac{1}{2}$ xxvj; digest for seven days, then press and strain.—P.L. Tincture of arnica is made by macerating $\frac{3}{4}$ iss of arnica flowers in lbj of spirit; vol. ix., page 548.

J. C.—*Baking Powder*. Vol. i., page 492, and vol. iii., page 495.

J. V. (Launceston).—Formulae for TOOTH POWDER are various and innumerable. Precipitated chalk or common prepared chalk answer very well. This may be coloured with rose pink or Armenian bole, or a small quantity of vermilion. It may be flavoured with orris powder, oil of cloves, otto of roses, &c. Powdered myrrh or bark may be added, and cuttle fish, Castile soap, magnesia, or carbonate of soda, &c.

A Member (Stoney Stratford).—*TOOTH PASTE*.—Precipitated chalk, 1 oz.; powdered myrrh and rhatany root, each 2 dr.; orris root, 1 dr.; honey of roses, q. s. to form a paste.

A Member (Weymouth).—(1.) The sale of drugs to brewers is prohibited by 56 Geo. III.; see vol. ii., page 549.—(2.) We think Phillips's translation is the best.—(3.) It is uncertain.—(4.) Bowman's *Introduction to Practical Chemistry*.—(5.) Knight, Foster Lane.—(6.) Galloway's *First Lessons on Chemistry*.

L. F. P. (Manchester).—Should write to the Secretary.

M. P. S. (Belper).—The specimen is pyrites.

We have received the specimen from a *Member*, Brighton.

We have also received from Dr. Landerer some "Observations on the Climate of Athens."

O. W.—Dr. Osier Ward's *biberon*, or sucking bottle, was exhibited at the *Conversazione*, see page 391.

Amator Scientiæ (London).—(1.) Fresh air.—(2.) Yes.—(3.) The proportion of the essence used must depend on the strength of the essence, which A. S. does not state.

We have to thank Mr. Jones for his communication.

Mr. Joseph Toynbee has been appointed Consulting Aural Surgeon to the Deaf and Dumb Asylum.

We have received petitions in favour of the Pharmacy Bill, from Teignmouth, Dorking, Hogathorpe, Burnham-Westgate, Hastingden (3), Burnham Market (2), Woodbridge (3), Bristol and Clifton, Norwich (3), St. Albans (2), Torquay (2), London (3), Welshpool, Dorchester, Hartlepool, Preston (2), which will be presented on the second reading of the Bill.

Dimidium Dimidiumque.—(1.) Umbelliferae.—(2.) Lehmann's *Physiological Chemistry*, published by the Cavendish Society, or Bowman's *Medical Chemistry*.—(3.) *Robinson on the Teeth*.

Photos.—Pertartrate of iron is sometimes called ferro-tartaric acid. Formo-benzoic acid is obtained by evaporating a mixture of commercial oil of bitter almonds and hydrochloric acid.

Registered Apprentice.—(1.) Balfour's *Manual of Botany*.—(2.) Certainly not.

A. M. Z. should consult a solicitor.

H.—Chemists' assistants are included among those who are exempted.

J. L.—It should be two fluid ounces.

T. (Chatham).—We were aware of the error.

Alpha.—(1.) For the process for silvering glass, see vol. iv., pages 82 and 194 of this Journal.—(2.) Examination is necessary, in accordance with the Charter of the Society.

R. C.—Fresenius's or Rose's *Chemical Analysis*.

M.P.S. wishes to be informed how leather is hardened for making artificial flowers.

J. C. desires to know what is the best application for producing a mahogany stain on wood.

ERRATUM.—In our last number, page 347, line 12 from bottom, for "known," read "unknown."

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, Secretary, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho. Other communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. X.—APRIL 1st, 1852.

THE PRINCIPLE OF THE PHARMACY BILL.

From the discussion in the House of Commons, on the second reading of the Pharmacy Bill (page 475), it is obvious that the object of the Bill is not clearly understood. With a view of removing any ambiguity which may exist in the terms of the Bill it may be well to state briefly its intended operation in relation to the several classes of persons to whom it refers, namely—

Medical Practitioners	Exempted from all interference, Clause 20.
Medical Practitioners in business as Chemists and Druggists before the passing of the Act.....	May at their option continue as before without interference, or if they relinquish the Medical Profession may be registered as Pharmaceutical Chemists.
Members of the Pharmaceutical Society: Original Members (including Associates). Examined Members.....	Registered as Pharmaceutical Chemists, Clause 9.
Recognised Chemists and Druggists, not Members	Registered as Pharmaceutical Chemists, Clause 9, on application and the production of evidence within a year of the passing of the Act.
Assistants and Apprentices	To be registered, Clause 10.
Recognised Chemists and Druggists neglecting to register, also Persons acting as Chemists and Druggists, but having no pretensions to a qualification, and not producing the required evidence...	Not registered, but exempted as persons in business before the Act, the <i>onus probandi</i> resting on themselves, Clause 15, lines 3 and 4.
Grocers and small shopkeepers, who sell a few common drugs	Not affected by the Act, unless they pretend to be Chemists and Druggists.
Future Pharmaceutical Chemists.....	Examined and registered, Clause 13.
The Public	At liberty to buy medicines where they think proper, but protected from imposition on the part of persons pretending to be what they are not.

From this brief analysis of the Bill it will be seen that it is not calculated to injure any class, that it does not create a monopoly or interfere with free trade. Vested interests are protected, qualification is established and recognised, imposition is prevented, and the register forms a line of separation between Medical Practitioners and Chemists on one side, and between Chemists and unqualified persons on the other.

The idea of Mr. Bouverie, that it is intended to convert Chemists into Medical Practitioners, is proved to be erroneous by the words of the Act, and by the explanation of its provisions to which his remarks were intended as a reply. His other inference, namely, that it is intended to raise a large revenue from Chemists already in business is equally fallacious, as the Act provides that all such persons are to be registered at their option, "without the payment of any fee." They will not be obliged to subscribe to the Pharmaceutical Society. On the contrary, they can only be admitted by election, according to the provisions of the charter. Those who become members will have a voice in the election of officers and the management of the Society, and will pay the subscription in common with other members. All parties, whether members or not, will be left in the undisturbed enjoyment of their existing independence and privileges as fully and amply as if the Act had never been passed. The question of

money has always been dealt with as a secondary consideration—as a means to obtain an end. Without the sinews of war nothing can be done, and all that is wanted is enough to defray the necessary expenses of maintaining the Institution in a creditable and effective manner. It will be for the Committee of the House of Commons to decide what provisions are to be made for this purpose, and what limits are to be placed on the powers of the Society.

The salutary effect of the Act will be gradual. No Act of Parliament could bring about a sudden revolution in the qualifications of a numerous and heterogenous class of persons. If all the present race of Chemists were as highly educated as they ought to be, an Act would be unnecessary. Such as they are they have a claim to be taken as the nucleus on which the improvement is to be founded, while at the same time justice requires that all vested interests should be protected. This was the case with the original Physicians, the barber Surgeons, and the "Apothecaries before the Act of 1815." Each of these bodies was characterized, in the first instance, by those imperfections which are inseparable from new institutions, but which, by the influence of legislation on the rising members, were gradually removed. The same result may be calculated on in the present instance. As each registered "Chemist before the Act" dies, or retires from business, his place will be filled by a successor who has passed the examination. Among those who are now preparing themselves for examination, some will, in process of time, become examiners, others will become teachers in the schools of Chemistry and Pharmacy, which the demand for education will call into existence. The attention of the entire body being directed to the progress of science and the march of education, all will find it their interest to keep pace with the times and to use such means as may be accessible for increasing their knowledge of the business. Thus a general improvement will be the result, and this will be no less creditable to the Chemists themselves than beneficial to the public.

We have stated that the complete reformation will of necessity be a work of time, probably from ten to twenty years. This, however, is no argument against the Bill. An interval must of necessity elapse between the time of sowing the seeds of Pharmaceutical education and the maturity of the crop of qualified Pharmaceutical Chemists.

Much advantage will arise from the investigation of the subject before a Select Committee of the House of Commons. Very little is known in that assembly respecting the constitution and proceedings of the Pharmaceutical Society, and when we consider how liable corporate bodies are to a variety of abuses, and the disposition which too often prevails to take improper advantage of irresponsible powers, it is not surprising that hesitation should be felt in enlarging the powers of an institution without a due inquiry into its objects, tendency, and all the circumstances connected with it.

At the time the Pharmaceutical Society was founded every precaution was taken to guard against abuses, and to avoid the errors into which other societies had fallen. Being designed as a means of ultimately uniting the entire body of Chemists and Druggists for the purposes of education, examination, and registration; and being formed not merely for the present time, but for the future promotion and regulation of Pharmacy in this country, it was necessary so to frame the constitution, that no mistake could hereafter arise respecting the objects of the Society, and the powers which it was intended to possess.

An Act of Parliament is the ultimatum which has always been in prospect as the only means by which permanence could be given to an organization of Chemists and Druggists for the regulation of the affairs of that body, and the advancement of the art and science of Pharmacy. After eleven years' experience in the practical working of the machinery created for the above purposes on the voluntary principle, a report before the Committee, of these proceedings and the result, will furnish tangible data, which did not previously exist, and which could not have been obtained except by actual experiment. The claim for an Act of Parliament rests, therefore, not on hypothesis, but on facts, and

whatever may be found defective in the Charter can be rectified by the Act. Several amendments have been suggested which will be duly considered, and in the investigation of the Committee the primary objects of the Society will be kept in view, namely, the benefit to the public by the security which the improved education will afford, and the advantage to the Chemists themselves by their union and future recognition as an educated body.

FRAUD AND QUACKERY.

In another part of this journal (page 478) will be found a condensed report of a trial, in which a verdict was obtained against one of those imposters who have hitherto defied restraint and braved exposure. The offence consisted in selling pills called "cod-liver oil pills," and fraudulently using the name of Sir James Murray, for the purpose of conferring a fictitious character on the nostrum. This is an artifice continually practised, sometimes in the most daring manner, sometimes more cautiously by means of a slight alteration in the spelling of the name. In almost all cases the deception is accompanied by a printed tissue of falsehoods, with certificates, either fictitious or emanating from dupes and accomplices. The Government stamp affixed to each box or packet serves the double purpose of giving the *appearance* of legislative sanction to the medicine, and giving the *reality* of a share of the profit to Her Majesty's Treasury.

In France the sale of secret medicines is strictly prohibited, unless the inventor or discoverer of the medicine has previously submitted the same to a competent tribunal, whose duty it is to examine into its merits and grant or refuse a licence to sell it. By this means the public are protected against those flagrant and dangerous frauds which prevail unrestrained in this country, and whatever may be the objections to secret medicines on general principles, this supervision is, to a certain extent, a protection to life and health.

In this country, medicine stamps are sold by the Government to any person who may think proper to purchase them; and, however worthless or dangerous may be the compound to which they are affixed, the person who has paid his money for the stamp and medicine licence has done all that the law requires, and may tamper with the public health according to his will and pleasure. Such has practically been the operation of the present state of the law, but the case of the "Cod-liver Oil Pills" furnishes a precedent which will have the effect of placing a certain limit on the privilege of imposition. By this precedent it is established that a person who has been persuaded by false and fraudulent statements to purchase a proprietary medicine, may, on proving the fact, recover a verdict in an action for damages. In the present instance the action was simply to recover the amount paid for that which was sold under a false description, and which proved to be worthless. If injury had been sustained by the use of a medicine sold under similar circumstances, the claim for compensation would have been much greater.

While on the subject of puffing we may notice a case in which the Great Exhibition has been made available for this purpose in a manner by no means creditable. Our readers may probably have seen show-cards in the following terms:—"Great Exhibition. First prize medal and honourable mention of Glenfield's patent starch." Advertisements to the same effect have been profusely inserted in the public newspapers, and we are informed that with every cwt. of starch, show-cards and 1000 hand-bills are enclosed containing the same statements, with a corresponding puff of the usual character. The starch may be remarkably good, or it may be no better than that which is usually sold—we are not discussing quality, but truth—but no medal was awarded for it at the Great Exhibition. In the first edition of the report of the Jury, the name was inserted by a clerical error, which was corrected almost immediately afterwards, but the statement is nevertheless persisted in up to the present time.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING,

Wednesday, March 10, 1852.

MR. HERRING, PRESIDENT, IN THE CHAIR.

THE following DONATIONS TO THE LIBRARY AND MUSEUM were announced :

The Proceedings of the Institution of Civil Engineers from the year 1837, from the Institution.

Beasley's *Druggist's Receipt Book*, from the Author.

Specimen of Petroleum taken from a pitch-well in the south-eastern part of the island of Zante, collected September 13th, 1819, by the late William Allen, F.R.S., presented by the Executors.

Specimens of African and Indian Millet, from Dr. Daniell.

Specimen of Sulphate of Quinidine, from Messrs. Howards and Kent.

Specimens of finely crystallized phosphate of soda, iodide of lead, acetate of zinc, iodide of potassium, and bicarbonate of potash, from Messrs. Huskisson & Co.

Specimen of Purified Grain Tin, from Mr. Phillipot.

BICARBONATE OF AMMONIA.

Mr. Scanlan laid before the Meeting a specimen of Carbonate of Ammonia, presenting some points of interest. It had been obtained as one of the products of the ordinary process for the preparation of sesquicarbonate of ammonia, and it differed from that salt in being devoid of any pungent smell. It was crystalline, transparent, and permanent, when exposed to the air. It formed the lowest portion of the sublimed cake of ammonia, the upper portions, consisting, as usual, of sesquicarbonate of ammonia. He had submitted some of the specimen to analysis, and obtained the following results :—

		Calculation.	1st Experiment.	2d Experiment.
NH ₃	Ammonia	21.52	21.44	21.44
2 CO ₂	Carbonic Acid ...	55.69	54.56	55.79
2 HO	Water	22.79	24.00	22.77
		100.	100.	100.

A similar compound was noticed some years ago by the late Mr. Richard Phillips, in the *Annals of Philosophy*, New Series, vol. i., for 1821, as having been received from Dr. Henry, of Manchester, who obtained it in a process adopted for making common smelling salt. Mr. Phillips had analysed it, and got the following results :

Ammonia	21.16
Carbonic Acid	55.50
Water	23.34

100.

ON THE BASIS OF THE EAU MEDICINALE D'HUSSON.

BY THOMAS BUSHELL, ESQ.

THE subject which I am about to bring under the notice of the Pharmaceutical Society relates to the history of a very powerful article of the *Materia Medica*, the "EAU MEDICINALE D'HUSSON," which, although now obsolete, is

still frequently referred to as the form in which colchicum was first introduced into medical practice; and, I trust, I shall be excused for occupying the attention of the meeting for a few minutes in relating some circumstances contributing to establish the identity of the *Colchicum Autumnale* as the basis of that remedy which enjoyed so great a repute about half a century ago as a proprietary specific for the treatment of gout and rheumatism.

A few days since I made inquiry of one of the chief vendors of patent medicines, at the west end of the town, if they now sold the Eau Medicinale; I was informed that it had not been inquired for for many years, but that they had been accustomed, when it was in demand, to receive it from a foreign perfumer in Bond Street. I then called at this house, and was politely informed that they were the proprietors and vendors of the Eau Medicinale D'Husson, but that they had not sold any for years, and that it had gone quite out of date. About four or five years ago they sold three or four bottles. I requested to be allowed to examine the remedy, and to see in what way it was sold or made up. After a little time two or three bottles were discovered; they held about two drachms, and were simply labelled "Eau Medicinale D'Husson." Printed wrappers, descriptive of its powers, were not at hand, and the parties seemed to have quite forgotten the doses in which it was administered. They informed me that the price was now nine shillings and sixpence, but was originally twenty-two shillings. The bottles were short and squat, quite curiosities in their way, and I could not resist revolving in my mind the great alteration which time and circumstances had made in the repute and consequent sale of this remedy, which at one time must have realized a splendid income to its proprietor.

The earliest medical notice I can find of the Eau Medicinale, is by Dr. Jones, in the year 1810, who had been on the continent in the years 1802 and 1803, with a gentleman who was a great sufferer from gout, and had then heard of the remedy of Husson, and which, on his return home in the year 1805, he was induced to make use of. He derived so much benefit from it, that from this time it made great advances as a remedy in England, and, to quote the words of the editor of the *Edinburgh Medical and Surgical Journal*, "noblemen and philosophers concurred in sounding its praises, if not in dancing hornpipes, in testimony of the new agility and flexibility of toe with which it had endowed them; and the President of the Royal Society, Sir Joseph Banks, who experienced the most extraordinary deliverance from his arch enemy, is said to have made it almost his pocket companion." It now became a great desideratum to ascertain its composition. Rhododendron, Chrysanthemum, Digitalis purpurea and lutea, Tobacco, Elaterium with opium, and many other plants, supposed to be analogous in their action to the magic water, were stated to form its basis.

Dr. Pereira states in his *Materia Medica* :

"The circumstances which have led to the extensive employment of colchicum in gout, are the following: About seventy years ago, M. Husson, a military officer in the service of the king of France, discovered, as he informs us, a plant possessed of extraordinary virtues in the cure of various diseases. From this plant he prepared a remedy called Eau Medicinale, which acquired great celebrity for abating the pain, and cutting short the paroxysm of gout. Various attempts were made to discover the nature of its active principle. In 1782, Messrs. Cadet and Parmentier declared that it contained no metallic or mineral substance, and that it was a vinous infusion of some bitter plant or plants. Alyon asserted that it was prepared with gratiola; Mr. Moore that it was a vinous infusion of white hellebore with laudanum; Mr. Want that it was a vinous infusion of colchicum. Although most writers have adopted Mr. Want's opinion, we should bear in mind that the proofs hitherto offered of its correctness, viz., analogy of effect, cannot be admitted to be conclusive, as is well shown by the fact that they have been advanced in favour of the identity of other medicines with the Eau Medicinale."

I should apologize for making so long an extract from Dr. Pereira's work, but as it contains a perfect epitome of all that I have ever seen on the subject of the so-called gout specific, and as it leaves the question of the identity of its

basis open to further inquiry, I hope that the circumstantial evidence which I now propose to lay before the Society, may somewhat clear up the point.

Mr. Want published his opinion in the *Medical and Physical Journal*, vol. xxxii., in the year 1814; and it was two or three years after that time, at the commencement of my apprenticeship, I was directed to prepare a preparation of colchicum in rum (four ounces of the dried cornus to a pint). I was residing close to Covent Garden Market, and frequently had conversations on plants, &c., with the late Mr. Grimley, the herbalist, to whom I applied for the colchicum. Mr. Grimley inquired of me if I knew how it was that the use of this remedy was discovered by Mr. Want? He then related the following circumstance:—Mr. Want had returned home from visiting patients, and met his wife on the stairs, and told her that her father had been seized with a violent attack of gout. The nursemaid, who was standing by, stated that she once lived with a little French gentleman, who prepared a secret remedy for the cure of gout, the Eau Medicinale; that he was accustomed to carry on his operations at the upper part of the house; and that there was a door on the staircase which he always kept locked, but that she had managed to obtain a little bit of one of the articles he made use of, and that she then had it by her locked up in her box. Mr. W. had not much difficulty in gaining a sight of this treasure. It was unknown to him, but he at once proceeded to Covent Garden Market, and applied to my informant, Mr. Grimley, to ascertain if he could recognize the portion of bulb. Mr. G. pronounced it to be the colchicum; and, to Mr. Want's further inquiry, informed him, that the only person who ever applied to them for it was a little Frenchman, and that he was accustomed to order from a cwt. to a cwt. and a half more than once in the season; that he adopted great precaution to prevent their obtaining a knowledge of what he did with it and from whence he came; that he always made inquiry if they had it ready, paid the amount charged, then brought a porter, who carried it to a hackney-coach which he had in waiting, and which immediately drove off with its precious charge—for precious it was, only to be compared to a lump of the Californian or Australian mineral, as its preparation sold for its weight in gold (two drachms twenty-two shillings). This relation, although occurring about three or four and thirty years ago, is quite fresh in my memory. I have related it to many, and about seven years ago I was in attendance on the late Earl Thanet, who suffered much from gout, and had a great objection to take colchicum. I happened to mention this little history, when he said, "You are quite right." I met that little Frenchman repeatedly years ago at the late Duke of Queensberry's, who was a martyr to gout, and to whom he used to administer the Eau Medicinale, he being the preparer of it. In the course of inquiry I have also found good reason to suppose that this little Frenchman was a well-known foreign perfumer, and has been dead upwards of twenty years, the founder of the house who now profess to be the proprietors of this once celebrated remedy.

I have stated that it was in the thirty-second volume of the *Medical and Physical Journal*, that Mr. Want first made public his discovery of the basis of the Eau Medicinale D'Husson, but I find on further reference that it was not in a medical but in a popular journal, the *Monthly*, that he had previously announced it. I should take up too much of the time of the Society, if I entered into the controversies which took place at this period, with respect to the reliance which could be placed upon this beyond the numerous other drugs which had been as confidently declared to form its active ingredient, and it was the opinion of many that ere long it would be consigned to the tomb of the Capulets. I find, also, that a charge was made against Mr. Want, by an anonymous correspondent, that he had gained a knowledge of its basis by means somewhat similar to what I have now related, but which he denied, stating that he had obtained the first hint from Alexander, of Tralles, who recommended a remedy, "Hermodactylon," for the cure of gout, and with the effects of which the Colchicum Autumnale entirely corresponded; and that this plant had entered into many gout remedies that had become obsolete. All

I am now desirous to say on this subject is, that the blue chamber being once penetrated, its mysteries might be readily compared with those which had preceded, but I believe the key was obtained in the manner I have related to the Society.

The present holders of the recipe for the Eau Medicinale, were so ignorant of its powers, as to inform me that two or three drops were a dose. I find that the usual dose was half a bottle, to be repeated, if the effect was not apparent, in four or six hours, but it was not uncommon for parties accustomed to its use, to take the whole two drachms, and repeated cases are on record of its powerful and dangerous effects; even life in some instances fell a sacrifice to its imprudent exhibition; and such was the experience also with the Colchicum Autumnale when first brought into practice, as it was considered to be a specific, and administered accordingly. This is not the place for entering into the therapeutical action of this valuable and potent plant, but its botanical and chemical characters are highly deserving the attention of the Members, and, combined with its Pharmaceutical preparations, might form matter for most interesting discussion.

There is a galenical compound in one of the French codexes called Eau Colchique D'Husson, prepared as follows:—Dry Colchicum, 60; Sherry, 125; twenty drops in a glass of *eau sacrée* in gout and rheumatism; and there is a remark that this will be observed to differ from the tincture or anti-gout drops of Want, which has been given as the Eau Medicinale. Mr. Want's first recommendation was four ounces of the fresh root sliced to half a pint of proof spirit.

Before I conclude, I must direct your attention to the observations of Dr. MacLagan, lately published in the *Monthly Journal of Medical Science*, Edinburgh, and from which your own valuable Journal of this month has an extract. I observe that Dr. MacLagan states that the flowers of colchicum are supposed to be the part of the plant used in the preparation of the Eau Medicinale.

117, Crawford Street, Portman Square.

ON SOCOTRINE ALOE JUICE, OR LIQUID SOCOTRINE ALOES.

BY JONATHAN PEREIRA, M.D., F.R.S.,
Physician to the London Hospital.

It has long been known that the Socotrine aloes imported into England varies considerably in its consistency, and is sometimes met with in a soft or semi-fluid state. Frequently, on opening a package of this sort of aloes the interior is found to be quite soft while the exterior is firm and hard. In general this arises from insufficient evaporation of the aloe juice.

In the third edition of my *Elements of Materia Medica* (vol. ii., part i., p. 1077), published in 1850, I have briefly referred to a soft or semi-liquid Socotrine aloes, which had a bright or palm-oil yellow colour and a very fragrant odour. At that time I had but little opportunity of investigating this very interesting drug; but a large importation of it having recently taken place, I have more fully examined it, and as it appears to me to be the raw or unboiled juice of the plant yielding what is known in commerce as Socotrine aloes, I propose to distinguish it from the ordinary soft Socotrine aloes by the name of "*Socotrine Aloe Juice*."

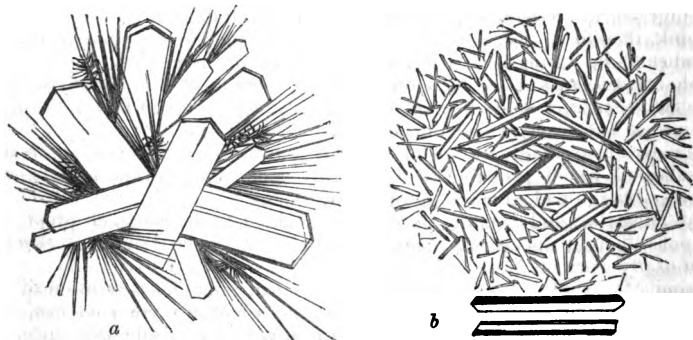
Messrs. Horner, the holders of the whole of the present importation of this juice, inform me that it was purchased of the Arabs up the Red Sea, by a merchant, who was assured by the vendors that it was very fine aloe juice, and had not been boiled or otherwise altered. It was imported into London by way of Madras, in casks each containing six cwt. I am informed that the contents of some of the packages have undergone decomposition during the voyage.

Its consistence is that of treacle or very thin honey; its colour deep orange

or palm-oil yellow; its odour powerful, fragrant, and resembling that of fine Socotrine aloes. By standing it separates into two parts,—an inferior, paler coloured, opaque, finely granular portion, and a superior, darker coloured, transparent liquid. The latter forms, however, a very small portion of the whole mass.

When the granular portion is submitted to microscopic examination, it is found that the opacity and granular appearance arise from myriads of beautiful prismatic crystals. If a temperature of 132° Fah. be applied to the juice these crystals melt or dissolve, and the juice becomes deep red and transparent; and when the liquid becomes cold it retains its transparency and does not deposit any crystals. By evaporation the juice yields a solid, transparent extract, having all the characters of fine Socotrine aloes, in which no trace of crystalline texture can be discovered. Mr. Jacob Bell has ascertained that 14lbs. of the juice yield 8lbs. 12ozs. of solid extract, or 62½ per cent. When the juice is mixed with cold distilled water, it becomes opaque yellow, and renders the water turbid, but is not miscible with it. If, however, heat be applied, the juice dissolves in the water, forming an almost clear, rich red liquid. As the solution cools, it at first becomes turbid owing to the separation of an opaque yellow precipitate, which, apparently, is the crystalline principle in an amorphous form. This gradually separates from the liquid and collects as a clear resiniform mass (commonly called the *resin* of aloes) at the bottom of the vessel, leaving the supernatant liquid tolerably clear. If the juice be shaken up with rectified spirit of wine an uniform clear mixture is obtained, from which numerous yellow crystals rapidly fall to the bottom of the liquid. Similar results are obtained when we mix the juice with equal parts of rectified spirit of wine and water.

This crystalline constituent of Socotrine aloes is, doubtless, either the *aloin* described by Messrs. T. and H. Smith, of Edinburgh, and by Dr. Stenhouse, or a principle closely allied to it. Dr. Stenhouse, to whom I have given a sample of it, is now engaged in its investigation; and in a letter which I have received from him, he says, that though he has not been able to get the aloin ready for analysis, yet, from the experiments he has already made with it, he has scarcely a doubt that it will be found identical with that formerly obtained from Barbados aloes. It forms, he adds, a precisely similar combination with bromine, and, in short, agrees with it in every particular; I shall, therefore, provisionally term this crystalline principle the *aloin* of Socotrine aloes. On comparing it with a fine specimen of aloin lately presented to me by Messrs. Smith, I find its crystals smaller and more tapering—the summits of the crystals being more acute.



Microscopic Appearances of Crystals of Aloin.

a. Aloin prepared by Messrs. Smith.

b. Aloin contained in Socotrine aloe juice.

(The magnifying power used was the same in both cases.)

In drying, the crystals of the Socotrine aloin have a strong tendency to break

up; so that crystals which in the moist state are moderately large and regular, become small and pulverulent when dry. Like the aloin crystals of Messrs. Smith, the aloin crystals of Socotrine aloes strongly doubly refract and depolarize light, and are, therefore, beautiful objects when viewed by the polarizing microscope.

The crystals of aloin contained in Socotrine aloe juice cannot be confounded with the crystals of oxalate and phosphate of lime found in the juices of various plants, and which are called by botanists *raphides*. The appearance under the microscope of the former is very different from that of the latter. Moreover, the ready fusibility, solubility, and complete combustibility of aloin crystals easily distinguish them from the calcareous salts just referred to. On platinum foil the aloin burns without leaving any residue, except such as may arise from the presence of traces of some foreign matter.

Aloin may be readily obtained from the juice by mixing the latter with spirit (either rectified or proof), and collecting and drying the precipitate. When procured in this way it appears to the naked eye like a yellow powder; but when examined by the microscope it is found to consist of minute fragments of crystals.

The tincture from which the aloin has been separated, yields by distillation a spirit having the fragrant odour of the juice; showing that the latter contains some volatile odorous principle. By evaporation the tincture yields a resiniform extract.

In the first edition of my *Elements of Materia Medica*, published in 1840, I have stated, that by digesting hepatic aloes in rectified spirit of wine, a yellowish granular powder is obtained, which is insoluble in [cold] water, alcohol, ether, and dilute sulphuric acid, but is readily soluble in a solution of caustic potash, forming a red coloured liquid. The powder-like residue here referred to, is identical with the aloin of Socotrine aloes. When examined by the microscope, it is perceived to consist of very minute prismatic crystals, which depolarize polarized light like the larger crystals of aloin above referred to. I think, therefore, that it may be safely inferred that hepatic aloes has been prepared without the employment of artificial heat, and that its opacity is due to the presence of minute crystals of aloin.

When Socotrine aloes is digested in rectified spirit an insoluble portion is also obtained; but its colour, instead of being yellow, as in hepatic aloes, is dark brown. On submitting this dark brown insoluble portion to microscopic examination, I find that it contains depolarizing crystals.

Artificial Socotrine aloes (prepared by evaporating this aloe juice) also yields, when digested in rectified spirit, a dark brown insoluble portion.

I think, therefore, that Socotrine aloes differs from hepatic aloes in the circumstance of its having been prepared by the aid of artificial heat; by which its aloin constituent has become altered. This inference is further substantiated by the fact, that after it has been melted, hepatic aloes is found to have acquired the clearness and transparency of the Socotrine sort.

The clear supernatant portion of aloe juice, from which the above crystals have subsided, would probably also yield, by spontaneous evaporation, an extract resembling, or identical with, Socotrine aloes.

That Socotrine and hepatic aloes were obtained from the same plant, and were not different species of aloes, I have long suspected; and in the first edition of my work on *Materia Medica*, published in 1840, I have observed that "the similarity of the odour of Socotrine and hepatic aloes leads to the suspicion that they are obtained from the same plant; and which is further confirmed by the two being sometimes brought over intermixed, the Socotrine occasionally forming a vein in a cask of the hepatic aloes."

This intermixture of the two sorts of aloes in the same cask might be explained by supposing that the consolidation of the clear portion of the juice has produced the so-called Socotrine aloes; while the opaque aloin-containing portion of juice has yielded what is termed hepatic aloes.

In the third edition of my work above alluded to, I have stated that the name of *opaque liver-coloured Socotrine aloes* might with propriety be applied to hepatic aloes. But until the present time I have been unable to offer a plausible explanation of the cause of the difference in these two commercial kinds of aloes.

From the preceding remarks I think we may infer:

1. That *aloin* pre-exists in a crystalline form in the juice of Socotrine aloes.
2. That the substance which deposits as a decoction of Socotrine aloes cools, and which is usually termed the *resin* or the *resinoid* of Socotrine aloes, is the *aloin* in a modified state.
3. That hepatic aloes* is the juice of the Socotrine aloes plant which has been solidified without the aid of artificial heat.
4. That hepatic aloes owes its opacity to the presence of minute crystals of *aloin*.
5. That the juice of Socotrine aloes yields, when evaporated by artificial heat, an extract possessing all the properties of commercial Socotrine aloes.

LIST OF MEMBERS, ASSOCIATES, AND APPRENTICES (*continued*).

Elected in January, February, and March.

MEMBERS.

ANSTRUTHER	Reid, David S.	Rodger Street
BARNET	Dowthwaite, William	High Street
BEDFORD	Ward, Thomas	High Street
CARNARVON	Griffith, Robert	High Street
CUPAR ANGUS	Gray, John	George Street
DALKEITH	Welsh, Alexander	High Street
DINGWALL	Dewar, Peter James	High Street
DUNDEE	Jobson, William	32, Mundygate Street
	Spence, Thomas Baird	5, Crichton Street
DURHAM	Morton, John	2, South Street
EDINBURGH	Aitken, William	3, Pitt Street
	Baildon, William	73, Princes Street
	Blanshard, George	15, Smith's Place, Leith Walk
	Brown, David Rennie	17, Northbridge Street
	Brown, Thomas	51, Frederic Street
	Carmichael, Lauchlan	15, Calton Street
	Croley, William	Broughton Street
	Fairgrieve, Thomas	46, Clerk Street
	Gordon, John	32, Bristo Street
	Grant, John Smyth	24, N. W. Circus Place
	Hunter, David	52, North Bridge Street
	Ker, Thomas	16, Leith Street
	Leith, James	14, Union Place
	Mackenzie, Duncan	
	McFarlane Wardlaw	52, North Bridge Street
	Oliver James	44, Broughton Street
	Robertson, James	George Street
	Sang, John G.	61, Great King Street
	Tait, William	139, Princes Street
	Young, James R.	North Bridge Street
FALKIRK	Cochrane, Thomas	High Street
GIBRALTAR	Roberts, Thomas H.	
GLASGOW	Campbell, John	120, Brunswick Street
GLOSSOP	Kinder, John	High Street
GREENOCK	Alexander, James	West Blackhall Street
HUNTLY	Pratt, William	Gordon Street
JEDBURGH	Turnbull, James	4, High Street

* By the term "*hepatic aloes*" I mean the opaque liver-coloured aloes imported into England from the East Indies (usually from Bombay). This sort of aloes is very different from the *hepatic Barbados aloes*, which formerly appears to have been exclusively called "*hepatic aloes*."

KIRKCUDBRIGHT	Whitewright, Thomas	Castle Street
LEAMINGTON	Keene, Alfred	115, Warwick Street
LEITH	Finlayson, Thomas	33, Talbooth Wynd
	Powell, Frederick William	18, Bernard Street
LINTON, EAST	Trotter, George	Prestonkirk
LONDON	Hickley, Thomas P.	125, Edgeware Road
	Hockin, John Brent	289, Strand
MALVERN, GREAT	Burrow, Walter Beeken	Belle Vue Terrace
MONTROSE	Burrell, George	43, High Street
MUSSELBURGH	Anderson, James	115, High Street
NORWICH	Sharland, William	Golden Ball Street
OSWESTRY	Smale, William	Cross Street
PERTH	Dandie, David	75, High Street
	Newby, William Henry	75, High Street
PORTOBELLO	Kemp, David	102, High Street
PORT LOUIS	Régnaud, Charles	Mauritius
PULTENEY TOWN	Nicol, George	Argyle Square
ROCHFORD	Harrington, Arthur	West Street
ROTHESAY	Macintosh, Archibald	Montague Street
SALFORD	Kershaw, George	2, Crescent
SANDWICH	Knowles, John James	Harnet Street
SHIELDS, NORTH	Corder, Octavius	Tyne Street
STIRLING	Kirkwood, William	King Street
STOURBRIDGE	Pearman, Henry	High Street
UXBRIDGE	Rayner, John	High Street
WELLINGTON	Tudball, William Gore	High Street
WOODBIDGE	Tuck, Charles	Church Street

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Boorne, Charles	Newbury
Brown, David Rennie	Edinburgh
Brown, Thomas	"
Carmichael, Lauchlan	"
Cochrane, Thomas	Falkirk
Croley, William	Edinburgh
Cuddeford, John	"
Dandie, Robert	"
Fairgrieve, Thomas	"
Finlayson, Matthew	"
Grant, John Smyth	"
Gray, Alexander Fullerton	"
Gray, John	Cupar Angus
Govan, Alexander	St. Andrews
Hodgeton, David	Edinburgh
Hood, William	"
Hunter, David	"
Jaap, John	"
Kemp, David	Portobello
Leith, James	Edinburgh
McFarlane, Wardlaw	"
Macintosh, James	Galashiels
Mackenzie, Duncan	Edinburgh
Mac Rae, James Ross	"
Parker, John	Reading
Peters, John	Edinburgh
Prott, William	Huntly
Régnaud, Charles	Mauritius
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Sang, John Grant	Edinburgh
Stathers, John	"
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Trotter, George	East Linton
Turnbull, James	Jedburgh
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Bell, James	Stockport
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Bew, John	Edinburgh
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Blanchard, William Raimes	"
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Cotton, Charles Newell	Plymouth
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Donald, John Hardy	Edinburgh
Forrest, Richard	London
Fryar, Robert	Edinburgh
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Lacey, Henry	"
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Mackay, Allan George	"
Macnaughton, Alexander	"
Noble, Alexander	"
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Smith, William	Hadleigh
Strickland, George W.	Lancaster
Spence, John Robertson	Edinburgh
Taylor, Stewart	"
Thomas, Llewellyn	Pontypool
Thomson, James	Edinburgh
Thomson, Evan Duncan	"
Turney, Samuel Blandford	Yeovil
Walker, William	Northampton
Whitwell, John H.	Ipswich
Wills, Thomas Doidge	Barnstaple
Winter, John Richard	Edinburgh

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Bucknill, Ebenezer	Mr. Corrie	Bedford
Caster, Samuel	Mr. Sturton	Peterborough
Chenery, William H.	Mr. Chapman	Ipswich
Cox, Charles	Mr. Wellington	Oakham
Dakin, John	Mr. Davies	Chester
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Drury, John T.	Mr. Harvey	Newark
Forrest, Charles	Messrs. Raimes and Co.	Edinburgh
Foster, Michael	Mr. Sturton	Peterborough
Gooch, William P.	Mr. Sprigg	St. Neots
Grant, Gregor	Messrs. Duncan and Co.	Edinburgh

APPRENTICES.	RESIDING WITH.	TOWNS.
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Hodges, Britton	Mr. Simcock	Andover
Holliday, Joseph.....	Mr. Wilding	Liverpool
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Macleod, Murdock	Messrs. Duncan and Co.....	Edinburgh
Oakley, James.....	Mr. Wellington.....	Oakham
Pain, Tertius D'Oyley.....	Mr. Reid.....	Blandford
Patman, George	Mr. Gale.....	Berkhamstead
Pattison, Henry	Mr. Hooper	Brighton
Phillips, George B....	Mr. Gilkes	Leominster
Priestley, James V.....	Mr. Edwards	Liverpool
Scott, James Douglas.....	Messrs. Gardner and Co.....	Edinburgh
Scott, James.....	Messrs. Raimes and Co.....	Edinburgh
Sidford, James.....	Mr. Witherington.....	Worcester
Skinner, John H.....	Mr. Mac Kay.....	Devonport
Smith, Edward	Mr. Lynch.....	Manchester
Stokae, Thomas	Mr. Reinhardt	Hull
Williams, Thomas	Mr. Spence.....	York
Wood, George	Messrs. Raimes and Co.....	Edinburgh
Yarrow, George	Mr. Fox	London

ORIGINAL AND EXTRACTED ARTICLES.

ON THE SYNSEPALUM DULCIFICUM, *De Cand.*;
OR, MIRACULOUS BERRY OF WESTERN AFRICA.BY WILLIAM F. DANIELL, M.D., F.R.G.S.,
Assistant Staff Surgeon.

AMONG other remarkable productions furnished by the vegetable kingdom in tropical Africa, is one which, from the peculiar properties it possesses, has gained a celebrity now permanently established. European voyagers and traders, who first experienced the singular effects of this fruit upon the palate, were, doubtless, greatly astonished at what to them must have appeared an extraordinary power, whose potency, for a certain length of time, could change the flavour of the most acid substances into a delicious sweetness, and on this account unanimously conferred upon it the characteristic title of the "miraculous berry," which it has retained, and by which it has since been appropriately distinguished. Well known to the Fante races by the name of *assarbah*, and in the Akkrah and Adampe districts by that of *tahmé*, this tree is by no means so rare as might be supposed, since it abundantly flourishes in most of the inland countries of the Gold Coast, and in and even beyond the remote regions of Ashanté, where, according to Bowdich, the berries are usually exposed for sale in the markets of Kumassé, and those of the adjacent provinces. It is also indigenous to Popo, Dahomy, Yorruha, and many kingdoms in the Gulf of Guinea, and may possibly be discovered in other countries between them and Old Calabar, since I have often met with a variety of the same fruit amongst the natives of the latter river, endowed with similar dulcificant virtues. Apparently the maritime districts fringing the coasts, are not so well adapted for its elevation as the interior, and therefore this tree is seldom seen by visitors, for when the fruit has attained the proper maturity, and may then be deemed most easy of acquisition, the largest quantities are obtained from a considerable distance inland, and from localities whose rich and loamy soils are better calculated to favour its productiveness. Akkrah chiefly derives its supply from the neighbouring kingdom of Aquapim, while Cape Coast, Annamabo, and Winnebah,

are said to claim the greatest proportion from that of Akim and the intervening localities. During the continuance of the rainy season these berries may always be purchased in the markets of the native towns to a greater or lesser extent in precise ratio to the difficulty of their attainment, but generally at comparatively trifling prices.

The earliest mention I can find concerning this product is in the work of a French traveller, called Des Marchais, who, in describing the vegetable productions indigenous to Whydah, has evidently alluded to it in some inconclusive notes, to which M. Pere Labat, the editor of his Journal, refers as "un petit fruit rouge, dont il ne donne, ni le nom ni la figure, et qu'il croit pouvoir croître en France. Il avoit apporté des pepins de ce fruit qui sont assez semblables aux pepins de nos poires. Ce fruit étant maché sans être avalé a la propriété d'adoucir ce qu'on peut mettre après lui dans la bouche de plus aigre et de plus amer."* The worthy father, however, is very incorrect in some of these details, but expresses his regrets for the negligence of the chevalier for not having afforded fuller information connected with this fruit, which he judiciously remarks might be employed with advantage to mask the taste of bitter and disagreeable medicines.

Dalzell, who resided for some time in command of the English fort at Whydah, and enjoyed constant opportunities of testing the wonderful effects of this product, has given us a much more faithful and copious delineation in his *History of Dahomey*, where, among other interesting points, he briefly adverts to the uses to which the Dahomians apply it. He also properly observes, that after the mastication of these berries, "food or drink not containing any acid, suffer no change by the previous use of this fruit; its effect upon acids continues even after a meal, though in a much smaller degree. The natives use it to render palatable a kind of gruel called *guddoe*, which is made of bread after it becomes too stale for any other purpose.† The editor of his volume, in a foot-note, suggested that the name of *Cerasus oxyglycus* should be bestowed on them, from the close similarity they afford to our common winter cherries. In 1798 the Danish government despatched the celebrated Thonning to undertake a series of scientific reports conjoined with various botanical researches, into the capabilities of their extensive colonial possessions on the Gold Coast, and this he effected with praiseworthy zeal and discrimination. The result of his labours in botany are chiefly incorporated in a volume entitled *Beskrivelse af Guineiske Planter*, in which he has furnished us with the first correct outline of this tree, described under the appellation of *Bumelia dulcifica*, with a short account of its appliances by the natives of Akkrah, appended thereunto. Meredith, in his "*Account of the Gold Coast*," has likewise noticed this miraculous berry, under its Fante term of Assarbah, remarking that it was brought to Winnebah from Akim, and is not to be confounded with the designation conferred on the cotton plant. Other references connected with its peculiar properties are equally to be found in subsequent works on this division of Western Africa.

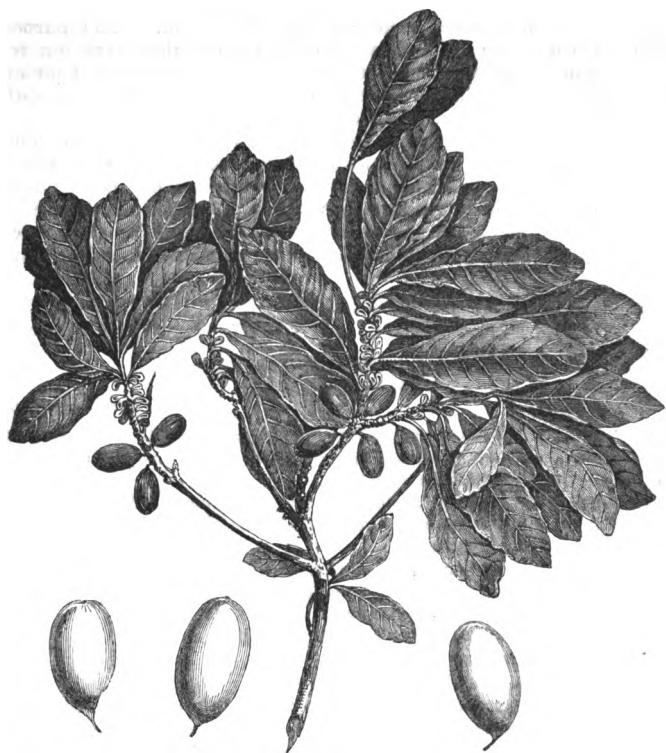
It was formerly known to botanists under the name of *Sideroxylon dulcificum*, until De Candolle, from the probability of its being a distinct genus, thought fit to classify it with others by the denomination of *Synsepalum*.

SYNSEPALUM, De Cand.—Calyx semi-5 fidus. Antheræ adnatæ obtusæ. Nomen ex adhærentiâ sepalorum. Forsan genus distinctum.

Synsepalum dulcificum. Class Pentandria, Ord. Monogynia, Nat. Ord. Sapotaceæ.—Foliis obovato-cuneatis, glaberrimis membranaceis integris, obtusis pedicellis solitariis paucisve flore petioloque brevioribus ferrugineo-pilosis, calyce infundibuliformi extus ferrugineo-pubescente apice 5-lobo, lobis obtusis rotundatis, corollâ calyce sublingiore glabrâ profunde, 5-fidâ, lobis obtusis, staminibus sterilibus ovato-lanceolatis, subulatis denticulatis longitudine fertilium drupâ ovoidæa monospermâ.

* *Voyage du Chevalier des Marchais en Guinée, en 1725*, t. ii., c. 8, p. 255.

† *Introduction*, p. 5.

*Synsepalum Dulcificum.*—*De Cand.*

Bumelia dulcifica. Rami glabri. Folia 4—6 poll. longa (incl. petiolo 2—3 lin) $1\frac{1}{2}$ —2 poll. lata. Flores sæpius post casum foliorum ex axillis erumpentes cernui cum pedicello 2 lin. longi. Tubus calycis basi acutus 5 costatus; lobi æstivatione 5-unciali. Corollæ lobi subdenticulati. Antheræ extrorsæ, ellipticæ obtusæ filimento brevissimo. Stamina sterilia et fertilia ex apice tubi corollæ sterilibus in præflorat, margine inflexis. Ovarium subpilosum globosum . . . locale. Stylus filiformis, glaber, corollâ fere longior. Stigma simplex, punctiforme. Drupa (ex Schum) magnit fere Grossulariæ, eduli, glaberrimâ, semine ovali subcompresso (v.s.) *De Cand. Prodrum. Sys. Nat., par. 8, p. 183. Thon. ved. Schum. Beskriv. af Guin., pl. 150, n. 72.*

This tree flowers in the months of June, July, and August, and in general produces a tolerable number of oblong or oval berries, about two-thirds in size of and somewhat resembling in figure an olive; these at first are of a dull green, but gradually change as they ripen, into a dusky red colour. The seeds are clothed externally by a thin, softish pulp, slightly saccharine, yet imparting that extraordinary impression to the palate by which the most sour and acidulous substances become intensely sweet, so that citric or tartaric acids, lime juice, vinegar, and all immature fruit of a sourish character lose their unpleasant qualities, and taste as if they had been solely composed of saccharine matter. The duration of these effects may be stated to depend upon the amount of berries chewed, and the degree of maturity they have attained, for when a sufficient quantity has been taken, their influence is commonly perceptible throughout the day. Their peculiar principle however is soon dissipated, if the fruit is suffered to remain in a ripe condition for any length of time, and their preservation in spirits, acetic acid, or syrup, does not appear to favour its retention, if I may judge from the specimens brought to England, since they have not only lost

their properties, but have become extremely insipid. The purposes for which the natives of the Gold Coast usually reserve them, are but few, the principal consisting in rendering their stale and acidulated kankies more palatable, and in bestowing a sweetness on sour palm wine and pitto. In Akkrah this is the more necessary from the circumstance that few or no palm-trees flourish in its vicinity, and hence the wine has to be conveyed a considerable distance inland from Aquapim, and from the time occupied in the transmission, the acetous fermentation has frequently commenced before its arrival, to remove which the previous employment of these berries is considered as indispensable. In other respects they would seem to be eaten more for the novelty of the sensations they induce than for any particular object.

ON THE REMARKABLE OPTICAL PROPERTIES OF A NEW SALT OF QUININE—THE IODIDE OF DISULPHATE OF QUININE.

BY WILLIAM BIRD HERAPATH, M. D.,
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32, Old Market Street, Bristol.

In order that the following arguments may be understood, it will be necessary to make a few prefatory remarks upon several terms frequently used in the description of the phenomena adduced.

Philosophers have been acquainted, since the time of Malus, with several methods of polarizing a beam of ordinary light; the principal of which may be arranged under two heads.

1st. Polarization by reflection; as from the surfaces of glass, china, water, resin, and other polished substances not possessing metallic properties.

2nd. Polarization by transmission, as

a. By double refraction, as by carbonate lime.

b. By absorption, as tourmaline.

c. By dispersion, as by agate, &c.

The words Polarization of Light may, perhaps, require some explanation; it is that faculty which certain bodies possess of so altering a beam of ordinary white light incident upon them, that it is no longer capable of being transmitted by certain other transparent substances, at certain angles or in certain positions; so that under the requisite conditions these crystalline diaphanous bodies become as if opaque to this polarized light.

The doubly refractive power of carbonate of lime has been generally made use of for the study of these phenomena, and Nicol's prism (a rhomb of carbonate of lime cut in a peculiar manner) has the power of splitting the incident ray into two equal portions, one of which it transmits polarized in one plane, whilst it obstructs the other, or that polarized in a plane at right angles to the transmitted ray. Upon revolving this prism on its axis, that beam which was before transmitted becomes obstructed in its turn, and thrown out of the crystal by reflection; whilst that before obstructed is now transmitted.

The phenomena exhibited by absorption are almost always studied by the action of the tourmaline on a beam of ordinary light. This mineral, when cut into plates parallel to the axis of the crystal, have the remarkable property of dividing the ray of light into two parts, one of which it transmits readily, but slightly altered in colour; the other it wholly absorbs, at least, it disappears, and is not to be found by the experimenter, until the plate is revolved 90°, when the ray becomes transmitted, and the former one now disappears.

When two such crystals are superimposed at right angles the whole of the light disappears; the first half is absorbed by the first or "polarizing plate" of tourmaline, technically called the "polarizer;" and the other half (slightly tinged) passes through polarized; which, as soon as it impinges upon the second crystal of tourmaline, is also absorbed. There is now no light transmitted, the field of view is as black as midnight or as opaque as the darkest bottle-glass.

When the tourmalines are in this position, if a thin film of selenite or sulphate

of lime be introduced between them at a certain angle of rotation, the light will now pass the second tourmaline and be transmitted to the eye—a certain thickness is required in this experiment as well as a certain angle of rotation. If the crystal be less than the 0.00046 of an inch in thickness the light is not transmitted; if it be above the 0.01818 of an inch the light passes, but perfectly white; if of any intermediate thickness, from 0.00124 of an inch to the 0.01818 of an inch, the most splendid coloured lights will be exhibited; either blue, yellow, red, or in various shades of these primary colours, or in various mixtures of them; so that we may have blue, orange, yellow, green, indigo or violet; according to the thickness, the law of this succession of change is known by philosophers to depend upon the thickness of the plate of crystal, and the changes pass through a certain order of colours; namely, those commonly known as Newton's rings, so that a colour of a certain order will always indicate a certain thickness of selenite plate.

These remarks will serve to introduce the phenomena about to be described; in which a peculiar crystalline compound of iodine and the disulphate of quina will be shown to possess the properties of tourmaline in a very exalted degree, as well as of a plate of selenite; so that it combines the power of polarizing a ray of light and also of depolarizing it—a most remarkable combination of properties.

Further, this discovery is the more remarkable inasmuch as a salt of a vegetable alkaloid is the material employed; that salt being a newly-discovered compound.

Some short time since these crystals were first noticed by my pupil (Mr. W. H. Phelps) to have been formed by accident in a bottle containing a large quantity of the mixed disulphates of quinine and cinchonine, prepared by dissolving the common official disulphate of quinine in diluted sulphuric acid in readiness for dispensing.

He could give me no account of their manufacture, and being struck by their peculiar brilliant emerald green colour, he showed them to me, and inquired what they were; they appeared so remarkable, even at first sight, that I considered them highly worthy of an elaborate investigation, the results of my experiments I now proceed to describe.

After a variety of experiments, it was found that they were in some way occasioned by the accidental introduction of iodine into the acid solution mentioned above.

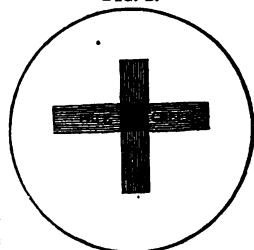
A larger quantity was immediately procured by dropping the compound tincture of iodine into a similar solution.

The crystals thus produced corresponded in every particular with those previously found; the following are a few of their characters:

They possess a brilliant emerald green colour when examined by reflected light; they shine like little gems, and are not unlike powdered cantharides, or at least the fragments of the elytra of this coleopteron; they are also very similar to murexide in appearance.

When examined by transmitted light they scarcely possess any colour, there is only a slightly perceptible olive-green tinge, but if two of these prisms, crossing at right angles, be observed, the spot where they cross appears as black as midnight, although the crystals are scarcely the 1-500th part of an inch in thickness. If the light used in this experiment be in the slightest degree polarized as by reflection from a cloud, or from the blue sky, or from the glass surface of the mirror of the microscope being at the polarizing angle for glass $56^{\circ} 45'$, these little prisms immediately assume complimentary colours, one appears green and the other pink, and the point at which they cross is a chocolate or deep chestnut brown instead of black.

FIG. 1.



As seen by transmitted light—ordinary white light.

Their chemical characters are the following:—

They are immediately redissolved upon heating the acid liquid to 180° , and recrystallize on cooling. Upon exposure to the air on a narrow slip of glass in contact with their mother-liquid, they are altered in shape, become slowly dissolved and disintegrated by dissection, in consequence of the gradual concentration of the acid solution from evaporation of the water. They are soluble in boiling alcohol, and again deposit on cooling, but the form is altered, they are rosettes. They are soluble in boiling acetic acid. Ammonia immediately decomposes them, a Naples yellow-coloured mass resulting. Liquor potassæ converts them into a deep chocolate-brown resinous mass.

The only method of preparing these crystals as objects for the microscope, is to cautiously neutralise the excess of acid of the mother-liquid by the addition of ammonia, but to take care that it be added in successive small quantities, short of precipitation of the excess of disulphate of quinine and cinchonine, then by very cautiously removing a drop of the mother-liquid containing these crystals in suspension, by means of a dropping tube in the usual way, and depositing them upon a plate of glass, allowing the crystals to subside quietly, gradually removing the fluid by the capillary attraction of bibulous paper; they soon dry by exposure to air, without much alteration in form (the acute angles are sometimes destroyed and become rounded); when dry the specimen must be mounted in Canada balsam in the usual way, with a plate of microscopic glass as a cover; but in this manipulation it is essential that the heat should be very sparingly employed to liquify the balsam, as otherwise the crystals would be destroyed.

As it was impossible to free these crystals from their mother-liquid or to wash them, as even distilled water acted on them, they could not be submitted to chemical analysis until some more ready method of preparing them had been discovered; the following plan gave every facility for obtaining them for this purpose:—

About ten grains of the mixed disulphates of quinine and cinchonine were dissolved in half an ounce of pyroligneous acid (acetic); into the hot solution was dropped a spirituous solution of iodine (without iodide of potassium), as the mixture cooled these little gems gradually formed; they were carefully separated on a filter, and re-dissolved in acetic acid by the aid of heat, a few drops of the tincture of iodine (simple) added, and on cooling they again deposited; a second re-solution and re-crystallization removed all trace of impurity; they were collected on a filter and dried.

Several specimens were procured in this manner and mounted in Canada balsam, as before; they produced a more perfect object, and were in every respect successfully prepared.

Chemical analysis:—

(A.) About three grains of these purified acetic crystals were re-dissolved in boiling acetic acid; whilst the solution was still warm, acetate of baryta was added, a white precipitate was immediately produced, it was insoluble in concentrated nitric acid, and proved to be sulphate of baryta.

(B.) Into the filtered portion from the last experiment, the excess of baryta, having been removed by a solution of sulphate of ammonia and again filtered, were dropped nitric acid and granules of starch, an abundant indication of the presence of iodine was instantly made evident.

(C.) Into the filtered fluid (B) was dropped solution of ammonia, a flocculent, white gelatinous precipitate was produced, this separated and fell to the bottom after some little delay; upon adding sulphuric ether and agitating the mixture, the precipitate was dissolved, and separated by decanting the ethereal solution from the watery fluid beneath; upon slowly evaporating the ether by exposure to the air, a gummy resinous mass remained, nearly destitute of colour, this was probably quinine, as it did not crystallize.

Other experiments were instituted to decide the question, whether the alkaloid was quinine or cinchonine.

1st. By taking advantage of the different degrees of solubility of the two disulphates in cold water, they were separated, and at length, after repeated operations, rendered perfectly pure.

It was found that upon treating solutions of each alkaloid in a precisely similar method, with iodine, crystals possessing these peculiar properties were only produced in the solution of the pure disulphate of quinine.

The disulphate of cinchonine solution was merely slightly reddened upon the addition of iodine; becoming turbid, a cinnamon brown precipitate falling, which upon heating in contact with the mother-liquid became indigo-coloured, and did not redissolve—no crystals were produced. Therefore it became probable that iodine, sulphuric acid, and quinine were absolutely necessary for the production of these crystals.

(A.) To decide the question whether the sulphuric acid was absolutely essential, a portion of the purified crystals was dissolved in acetic acid, and whilst hot acetate of baryta was dropped in until no further precipitation occurred, the solution was filtered whilst hot, and upon cooling there was no appearance of any crystallization after remaining several days.

(B.) Another portion of these crystals was dissolved by boiling in rectified spirit of wine; a bright sherry wine-coloured fluid resulted, it was divided into two portions.

(a.) The first was allowed to cool spontaneously; the crystals again deposited themselves, but in rosettes, instead of prisms—the component crystals were small hexagonal plates, several of them with their angles rounded off; but they possessed the same optical properties as before.

(b.) The second quantity of spiritous solution was treated whilst hot with acetate of baryta, there was an immediate precipitation of sulphate of baryta; the supernatant fluid on cooling remained perfectly transparent, and no crystals formed after several days.

(c.) The mixed alkaloids were prepared by precipitating the disulphates with liquid ammonia—these were carefully washed on a filter, and the precipitate dissolved in acetic acid (proved to be free from sulphuric acid) upon adding a spirituous solution of iodine to the solution of acetate of quinine and cinchonine no crystals were produced, but an amorphous dark-coloured precipitate, the mixed iodides of quinine and cinchonine. This experiment was repeatedly tried under every variety in the degree of concentration and length of time of deposition, but invariably with the same results.

Therefore, it is rendered certain that iodine, sulphuric acid, and quinine are the constituent elements of this peculiar body, and it is probable that they are arranged as a binary compound; the disulphate of quinine acting as a feebly electro-positive base to the iodine as an electro-negative; it is, therefore, conjectured to be an iodide of the disulphate of quinine.

It now became an interesting question to decide whether any other of the vegetable alkaloids would act in a similar manner with iodine; the same experiments were tried with the salts of morphia, brucia, strychnia, salicine, cinchonine, and quinidine, but without success; we may, therefore, almost confidently depend on the production of these crystals being indicative of the presence of quinine in a given solution, and also as establishing the difference between the alkaloids quinine and quinidine (β quinine).

It is to be regretted that the atomic weight has not yet been determined; but hitherto time has not permitted the necessary experiments to be undertaken.

CRYSTALLINE FORMS.

This substance presents itself under a variety of crystalline forms; a slight circumstance only is necessary to occasion a change.

When formed from a solution of the disulphates of quinine and cinchonine, in diluted sulphuric acid, they present the form of parallelograms—exceedingly slender and elongated; the terminal planes are rectangular; the thickness being scarcely appreciable, even less than $\frac{1}{1000}$ part of an inch; but some exceed the $\frac{1}{100}$ th part, the length and breadth being very variable.

The transition of this form to the square plate is very easy and is frequently observed.

By truncating the angles of this form we derive an octagonal plate, also very common.

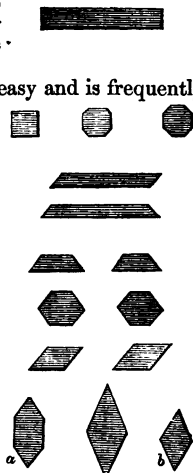
Under other circumstances the aciculæ change the form of their terminal planes and become acutely pointed; this is frequently seen.

By shortening the length and increasing the breadth we obtain the half-hexagon.

By joining two of these base to base we obtain the hexagonal plate, very frequently found in the acetic crystals.

The rhomboidal plate is also very common.

The lozenge is formed when we crystallize from alcohol—this is derived from the hexagon *a*, or the rhomboid *b*.



When a larger quantity of the disulphates is dissolved in acetic acid and a very few drops of a spirituous solution of iodine are employed (say four or five), the mixture left several hours in perfect repose, to cool and crystallize, enormously large broad plates are produced, apparently formed of many aciculæ cohering by their elongated edges; these plates, by very careful manipulation indeed may be transferred to a thin plate of microscopic glass, and dried; when set up in Canada balsam and properly mounted it becomes available as a polarizer; and in this way a crystal has been mounted by the author and adapted to his microscope in place of a tourmaline—over which it possesses some decided advantages: namely, it allows more light to pass in one direction, but it wholly stops out the beam when crossed by another polarizing crystal of the same substance, or by a tourmaline, or Nicol's prism—in fact, it is the most perfect polarizer known.

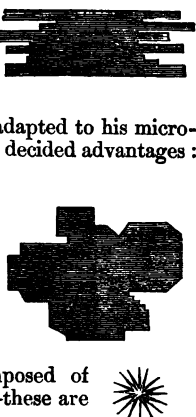
Frequently they assume a form derived from the cuboid plate, compounded of several of these joined edge to edge, the angles being at the same time more or less truncated and replaced.

Under other circumstances it forms small stellæ, composed of aciculæ, radiating from a centre like the spokes of a wheel—these are true rhombic prisms.

Under other circumstances they are formed of the same shape as the ammonico-magnesian phosphate from alkaline urine—the short pyramid; this form occurs when we suspend a solid plate of iodine in a solution of the disulphates in acetic acid, and set them aside for some days to slowly crystallize.

The primary forms of all these crystals appear to be the rhombic prism—all the others may be derived from this form, according to the known laws of crystallography.

But one remarkable fact is evident throughout the whole of this crystalline metamorphosis, the optical properties remain the same, and the merest film of



this extraordinary substance possesses decided power over the rays of light, even if its thickness be reduced to the limits of optical definition.

The optical properties remain to be more minutely described, and it is understood that the crystals are examined by an achromatic microscope, made by M. Oberhauser, having an half-inch object glass and a two-inch eye-piece, possessing a total magnifying power of 100 diameters.

OPTICAL PROPERTIES.

(A.) Their brilliant emerald green colour reflected to the eye has already been considered. This beam of green light produced by reflection is decidedly a polarized ray when the plane of the crystal is inclined 41° to the plane of the incident ray.

(B.) Their perfectly transparent and almost colourless appearance when examined by transmitted light has also been noticed.

(C.) The production of complimentary colours when examined under a slightly polarized light has also been noticed.

(D.) The action of a single tourmaline on them is very decided.

(E.) The action of two tourmalines must also be investigated.

(F.) The action of one tourmaline and a selenite stage is also very peculiar, and will be further examined.

(G.) The action of two tourmalines and a selenite stage must also be explained.

(H.) The phenomena exhibited by these crystals when used as polarizers and analyzers are also worthy of remark, and, of course, various crystalline substances used as tests of their remarkable polarizing properties will be fully treated of in the subsequent sections.

(I.) The phenomena of depolarization by these crystals will be touched upon under sections C and E.

(B.) The perfect polarizing powers which these crystals exhibit must now be proved and illustrated. When two crystals of the prismatic form are examined in a superimposed condition, the following effects result:

1st. If the two prisms are perfectly parallel in their long diameters, the ray of light will pass through unaltered.

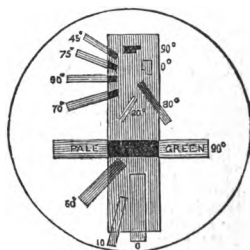
2d. When they cross each other at a right angle the small square spot where they intersect, will be as black as midnight—the two rays are both obstructed; that is, about half the incident ray of ordinary light is stopped or absorbed by the first or lower crystal, the other half transmitted by it in a polarized state; this impinging upon the superior crystal is stopped by it effectually.

3rd. When the two crystals cross each other at an angle of 45° polarization also occurs, but not to the same extent; the spot where the two crystals intersect is seen to be decidedly darkened.

4th. There is a perceptible polarizing effect produced at an angle of 30° ; below this there does not appear to be any effect on the transmitted rays.

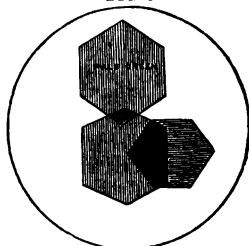
The same effects may be investigated by examining the hexagonal crystals. (Vide fig. 5).

FIG. 4.
To show the varying intensity of polarizing powers at different angles.



Group of Crystals arranged at various angles—ordinary white light.

FIG. 5.



Group of Hexagonal Crystals, showing similar phenomena.

(C.) When three crystals are examined in a superimposed state, two being at right angles and therefore dark, and a third placed between these, the phenomena of depolarization is produced, the interposed crystal permits the light to pass through, and at the same time communicates to it the order of colour equivalent to its thickness, in the same manner as a plate of selenite would do if interposed between two tourmalines at right angles one to the other.

The angle of depolarization appears to be 45° to the plane of either polarizing or analyzing crystal; but the phenomenon will take place in a minor degree at other angles.

In fig. 6 the prisms *a* and *b* cross at the square *d*—and produce a perfectly dark field; the prism *c* crosses this at an angle of 45° ; the hexagonal space is of course bright pink, from the depolarizing effect described; the four small triangular spots are somewhat darkened, in consequence of polarization occurring from the reciprocal action of *c*, on *a* and *b*.

In fig. 7 the three hexagonal plates exhibit the same phenomena, *a* and *b* cross each other at 90° , whilst the plate *c* intersects them at 45° , passing between them; the half-crystal *d*, pentagonal in form, is the polarized space, and No. 2, where *c* interposes, producing pink as before. Spaces 1 and 3 are partially polarized and darkened.

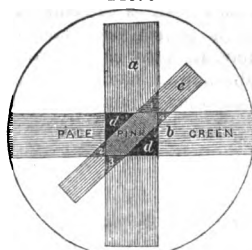
(D.) The action of a single tourmaline, or Nicol's prism, is very marked, and proves beyond a doubt that these crystals possess both the polarizing and the depolarizing powers.

In the first place, by examining two of these crystals placed at right angles, the one to the other, with a single tourmaline, or Nicol's prism, one crystal is perfectly black and obstructs all the light, the other is as transparent as ever. Upon more closely analyzing this experiment it will be found that the crystal, whose length crosses the plane of the tourmaline at right angles, is the dark one; whilst that one whose long diameter is parallel to the plane of the tourmaline is transparent.

Upon rotating the tourmaline 90° , or one quarter of a circle, the crystal which was before transparent now becomes dark, and that which was dark becomes transparent. This experiment establishes the fact of polarization without a doubt.

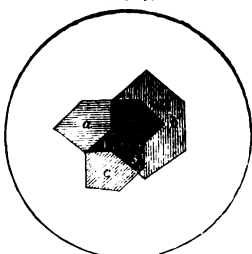
It remains to prove their depolarizing power with equal certainty.

FIG. 6.



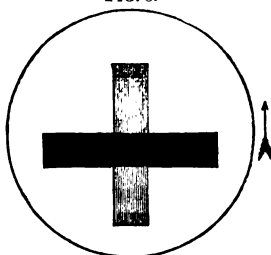
Three Crystals: two crossing at polarizing angles—third intermediate, and showing depolarization.

FIG. 7.



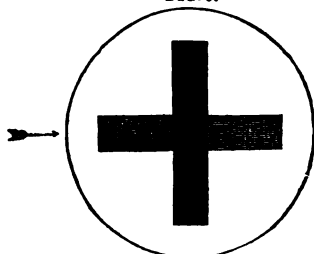
Same experiment; but with Hexagonal Crystals.

FIG. 8.



Examined by a single tourmaline. [The arrow shows the plane of tourmaline.]

FIG. 9.



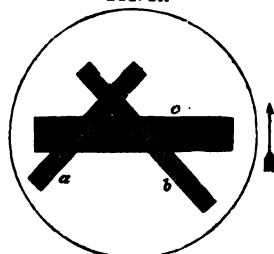
Examined by a single tourmaline, at right angles to former position. [The arrow again shows the plane of tourmaline.]

At fig. 10 are arranged three crystals *a*, *b*, and *c*; the latter is inferior in position to the two former; which are found to cross at 45° to the plane of *c*; but at 90° to each other respectively: upon examining this combination with a single tourmaline at right angles to the plane of *c*, of course the phenomenon of polarization will be shown by *c*—it will appear black.

The crystals *a* and *b* are of course at 45° respectively to both the tourmaline and to *c*, they are, therefore, at the angle of depolarization as in section *B*, and of course will exhibit coloured images where they cross the polarized field, one being complimentary to the other in colour; as they cross each other at right angles, they here exhibit the phenomenon of polarization, and darkening is the result.

(To be continued).

FIG. 10.



Three crystals examined by a single tourmaline, showing polarization, and also depolarization.
[The arrow shows the direction of the axis of tourmaline.]

ON M. SOLEIL'S POLARISCOPE, FOR DETERMINING THE QUANTITY OF SUGAR IN A SOLUTION.

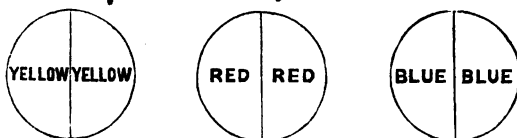
BY H. BENCE JONES, M.D., F.R.S.

(Extracted from the Medical Times and Gazette.)

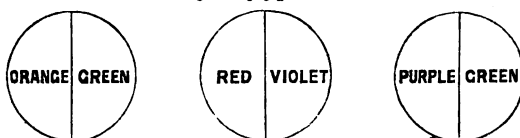
Within the last few months, an apparatus has been perfected by M. Soleil, which is far more convenient, and easy of use than the processes usually adopted for determining the quantity of sugar in any solution. Its action depends upon this principle,—that a solution of sugar has the property of altering the plane of polarization, causing it to rotate to the right or to the left, according to the nature of the sugar. Solutions of different strengths produce different amounts of rotation. The apparatus is only a means for determining the degree of rotation by the principle of compensation. It consists, 1st, of a polariser; 2ndly, of a tube for holding the solution to be analysed; and, thirdly, of an analyser. The polariser is a prism of Iceland spar. The extraordinary rays alone are passed through a circular plate of quartz, composed of two half circles possessing equal and opposite rotatory power; from thence the light passes through the solution of sugar. Any solution of grape-sugar, will alter the effect of the light which has passed through these two semicircular plates, when examined by the analyser, which is an ordinary double refracting prism; and the alteration will vary with the strength of the solution of sugar. The light which passes through the two semicircular plates, when analysed before the solution is put in, will be of the same colour; but afterwards there will be a great difference between the colour of the two plates, and by means of an admirably contrived compensator, the difference between these two colours can be measured. The compensator consists of two wedges of quartz, the thin edges touching, so that they can be slipped across each other, and, when brought together, they will be of a uniform thickness, and, together, they will produce an equal and opposite effect to a single plate of quartz placed before them. By means of a little screw you can alter the thickness of the two wedges, by separating or closing them; and according to the thickness will be the reaction upon the other plate, which has a fixed and determinate rotation in the opposite direction. The colours, you know, vary according to the thickness of the layer of quartz. I can draw the two plates one upon the other, so that they may neutralize the single plate, or separate them so much that they will give entirely different reactions with the light that comes through from the polariser. In this way, when any solution containing sugar is introduced, it is possible to measure how much it is necessary to slip one wedge over the other, so as to make the colours the same as they were before the solution was introduced. A graduated scale is provided for this purpose, in connexion with the apparatus, and by means of standard solutions, in which the quantity of sugar was known, the value of each degree has been determined.

With a tube for the solution 7.38 inches long, (= 20 centimetres), one hundred divisions of this scale correspond to 3482.37 grs. of diabetic sugar in one pint, fifteen ounces, and one drachm of urine; so that a solution of any unknown quantity can be placed in the apparatus, and, by moving the scale, the amount of sugar can be accurately determined; and with colourless solutions this may be done in the course of five minutes. When urine is tested, it must be mixed in a bottle with a little sub-acetate of lead, so as to take away its colour without affecting the sugar. It is then filtered, and a clear solution passes through, of which I have here a specimen. This solution is placed in a small tube, about eight inches long, and accurately filled. The tube is closed by means of a plate of glass with a screw. The tube is placed in the instrument, the scale having been previously brought to zero. Before the solution was placed in the instrument, the colours on the two semicircular plates, as I have explained, would be precisely the same; but the effect of the liquid would be to change them, and the degree of change is ascertained in the manner I have described.

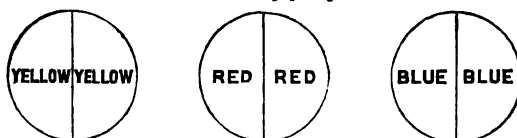
No Sugar.



Sugar Fifty per Cent.



Scale moved Fifty Degrees.



The most perfect results can thus be obtained; and I know nothing superior to this beautiful instrument—it is a perfect triumph of instrumental art.

THE SODA PYROPHOSPHATE OF IRON.

BY MR. LINDSEY BLYTH.

Addressed to Alexander Ure, Esq., Surgeon to St. Mary's Hospital.

DEAR SIR,—MORE urgent duties have prevented me from completing sooner the inquiry I promised to make for you respecting the composition of Persoz solution, containing the soda pyrophosphate of iron. I believe I have now so far completed it as to give you the results of my investigation. I prepared the solution strictly according to Persoz formula, and by careful evaporation succeeded in separating the pyrophosphate salt from the sulphate of soda formed in the decomposition of the persulphate of iron by the pyrophosphate of soda. I then dissolved out the pyrophosphate by means of a solution of carbonate of ammonia, and on evaporating the solution I obtained a non-crystalline salt, which broke up into scales similar to the other double salts of iron. This salt is perfectly soluble in distilled water (although it requires a little time to do so), and gives the characteristic reactions of a salt containing pyrophosphoric acid and the peroxide of iron. 100 grains gave the following composition:—

Peroxide of iron	16
Phosphoric acid	37
Soda.....	13

Which is nearly in the proportion of Persoz formula for the soda pyrophosphate of iron. The remaining quantities may be placed to the carb. of ammonia and water, the exact proportion of which I did not determine. It is so easy to draw out formulæ of the probable decompositions that ensue, that I think we ought to satisfy ourselves by an exact determination before giving them. Persoz has shown that new double salts are formed when the precipitate first produced is redissolved in excess of the alkaline pyrophosphate, by the reactions they give, and has succeeded in crystallizing out definite and constant compounds. From these results I deduce the following conclusions:—

1st. That in the original solution we have formed a pyrophosphate of iron and soda, and sulphate of soda with a slight excess of pyrophosphate of soda.

2. That in the combination of the pyrophosphate of iron and soda with a salt of ammonia, we have a salt which may also be of service as a medicinal agent.

The pyrophosphates offer a very interesting field of research to the Chemist, and no doubt other combinations than those with iron might introduce a new series of salts to the notice of the medical profession. My young friend, Mr. Prout Gridwood, has very kindly watched some of the processes, which would otherwise have occupied more attention than I could have given to them. Persoz says:—

“Two methods are employed for the production of these salts (the double pyrophosphates). By the one method, a solution of alkaline pyrophosphate is added to the solution of the other salt until no further precipitate is produced, the insoluble pyrophosphate is then brought upon a filter, washed, and digested with a solution of pyrophosphate of soda or potash, which acts the part of a base, and the solution is then submitted to spontaneous evaporation. There are two objections to this plan, the loss occasioned by washing the pyrophosphate, and the difficulty of obtaining solutions in a fit state for crystallization.

“The second method consists in diluting a solution of the chloride, or sulphate of the metallic oxide, which is to yield the insoluble pyrophosphate, so that too dense a precipitate is not formed. The alkaline pyrophosphate is then added with constant agitation and great caution, any excess beyond the quantity absolutely necessary for the solution of the precipitate being avoided. The solution will then contain:—

“1. The double pyrophosphate.

“2. The excess of alkaline pyrophosphate.

“3. Sulphate of potash or soda, or chloride of potassium or sodium.

“On the spontaneous evaporation of the soda compound, the excess of pyrophosphate of soda will crystallize first, then the chloride of sodium or sulphate of soda, and lastly, the double pyrophosphate.

“If potash has been employed, chloride of potassium or sulphate of potash will be deposited first, then the double salt of pyrophosphoric acid and the excess of pyrophosphate of potash will be found in the mother liquor.”—See *Journal of Chemical Society*, p. 183, vol. i.

In examining the double salt of pyrophosphate of iron and soda, I have used the pyrophosphate of soda and the tersulphate and the sesquichloride of iron. Whether the double salt to be employed medicinally be obtained, as in Persoz solution, or the precipitated pyrophosphate of iron be washed and separated and redissolved in an excess of the alkaline pyrophosphate, I think the tersulphate of iron is to be preferred to the sesquichloride, as much more easily prepared free from acid, as in Persoz formula, by carefully drying it under a clear fire, whilst the sesquichloride would have to be sublimed to effect the same object, a very difficult and tedious operation. Of course, in the preparation of a salt of chemical purity the same objection would not hold good.

ON ALOINE, THE CRYSTALLINE CATHARTIC PRINCIPLE OF BARBADOS ALOES.

BY JOHN STENHOUSE, L.L.D., F.R.S.L., & E.

ABOUT two months ago I received from my friend, Mr. Thomas Smith, Apothecary, Edinburgh, a quantity of a brownish-yellow crystalline substance which he had obtained from Barbados aloes. Mr. Smith's process consisted in pounding the previously dried aloes with a quantity of sand, so as to prevent its agglutinating, macerating the mass repeatedly with cold water, and then concentrating the liquors *in vacuo* to the consistence of a syrup. On remaining at rest in a cool place for two or three days, the concentrated extract became filled with a mass of small granular crystals of a brownish-yellow colour. This is the crude substance to which Mr. Smith has given the name of Aloine, and which appears to constitute the cathartic principle of aloes. The brownish-yellow crystals obtained in this way are contaminated with a greenish-brown substance, which changes to brownish-black on exposure to the air, and still more rapidly when it is boiled. In order to purify the crystals of aloine, therefore, they must first be dried by pressure between folds of blotting-paper, and then repeatedly crystallized out of hot water till they have only a pale sulphur-yellow colour. The aqueous solutions of aloine must on no account be boiled, but simply heated to about 150° F., as at 212° F. aloine is rapidly oxidized and decomposed. By dissolving the purified crystals of aloine in hot spirits of wine, they are deposited, on the cooling of the solution, in small prismatic needles arranged in stars. When these crystals have a pale yellow colour, which does not change when they are dried in the air, they may be regarded as pure aloine.

Aloine is quite neutral to test-paper. Its taste is at first sweetish, but soon becomes intensely bitter. Aloine is not very soluble either in cold water or in cold spirits of wine; but if the water or the spirits of wine are even slightly warmed, the solubility of the aloine is exceedingly increased: the colour of these solutions is pale yellow. Aloine is also very readily dissolved by the carbonated and caustic fixed alkalies in the cold, forming a deep orange-yellow solution, which rapidly grows darker, owing to the oxidation which ensues. The effects of ammonia and its carbonate are precisely similar. When aloine is boiled either with alkalies or strong acids, it is rapidly changed into dark brown resins. A solution of bleaching-powder likewise gives aloine a deep orange colour, which soon changes to dark brown. Aloine produces no precipitate in solutions either of corrosive sublimate, nitrate of silver, or neutral acetate of lead. It also yields no precipitate with a dilute solution of subacetate of lead; but in a concentrated solution it throws down a deep yellow precipitate, which is pretty soluble in cold water, and is therefore difficult to wash. This precipitate is by no means very stable; and when it is exposed even for a short time to the air, it becomes brown.

When powdered aloine is thrown, in small quantities at a time, into cold fuming nitric acid, it dissolves without evolving any nitrons fumes, and forms a brownish-red solution. On adding a large quantity of sulphuric acid, a yellow precipitate falls, which, when it is washed with water to remove all adhering acid and then dried, explodes when it is heated. It plainly, therefore, contains combined nitric acid. I could not, however, succeed in obtaining this compound in a crystalline state, as when it was dissolved in spirits, it appeared to be decomposed. When aloine is digested for some time with strong nitric acid, much nitrous gas is evolved, and it is converted into chrysammic acid, but without the formation of any nitro-picric acid, as is always the case when crude aloes is subjected to a similar treatment. A quantity of aloine was boiled with a mixture of chlorate of potash and muriatic acid. The acid solution was evaporated to dryness, and digested with strong spirits of wine. The greater portion of the spirits was removed by distillation; and the remainder, when left to spontaneous evaporation, yielded a syrup which could not be made to crystallize. Not a trace of chloranil was produced.

When aloine is destructively distilled, it yields a volatile oil of a somewhat aromatic odour, and also a good deal of resinous matter. When aloine is heated on platinum foil it melts, and then catches fire, burning with a bright yellow flame, and emitting much smoke. It leaves a somewhat difficultly combustible charcoal, which, when strongly heated, entirely disappears, not a trace of ashes being left.

A quantity of aloine dried *in vacuo* was analyzed with chromate of lead in the usual way.

- I. 0.2615 grm. aloine gave 0.5695 carbonic acid and 0.14 water.
 II. 0.2415 grm. aloine gave 0.5250 carbonic acid and 0.126 water.

Hydrated aloine. Calculated numbers.		Found numbers.	
		I.	II.
34 C..	2550.0	59.47	59.39
19 H	237.5	5.54	5.97
15 O	1500.0	35.09	34.64
	4287.5	100.00	100.00

The formula derivable from these analyses is $C_{34}H_{18}O_{15}$, which, as we shall presently see, is $= C_{34}H_{18}O_{14} + HO$, or aloine with one equivalent of water.

The aloine which had been dried *in vacuo* was next heated in the water-bath for five or six hours, and was also subjected to analysis.

- I. 0.251 grm. aloine dried at 212° F. gave 0.550 carbonic acid and 0.128 water.
 II. 0.2535 grm. aloine dried at 212° F. gave 0.564 carbonic acid and 0.129 water.
 III. 0.234 grm. aloine dried at 212° F. gave 0.521 carbonic acid and 0.114 water.

Calculated numbers.		I.	II.	III.
34 C.....	2550	61.07	60.51	60.67
18 H.....	225	5.39	5.66	5.65
14 O.....	1400	33.54	33.83	33.68
	4175	100.00	100.00	100.00

The aloine employed in these analyses was prepared at three different times. These results give $C_{34}H_{18}O_{14}$ as the formula of anhydrous aloine, that dried *in vacuo* being a hydrate with one equivalent of water.

When the aloine was allowed to remain in the water-bath for more than six hours, it continued slowly to lose weight, apparently owing to its undergoing partial decomposition by the formation of a brownish resin. The loss of weight gradually continued for a week or more, but became very rapid when the aloine was heated to 302° F., when it melted, forming a dark brownish mass, which when cooled became as hard and brittle as colophonium. It still, however, contained a good deal of unaltered aloine, as I ascertained by crystallizing it out with hot spirits and analyzing it. Much of the aloine, however, had been changed, most probably by oxidation, into a dark brown uncrystallizable resin.

Brom-aloine.—When an excess of bromine is poured into a cold aqueous solution of aloine, a bright yellow precipitate is immediately produced, the amount of which increases on standing, while at the same time the supernatant liquid becomes very acid from containing free hydrobromic acid. The precipitate, after it has been washed with cold water to remove adhering acid, is dissolved in hot spirits of wine; and on the cooling of the solution it is deposited in bright yellow needles radiating from centres, which attach themselves to the bottom and sides of the containing vessel.

The crystals of brom-aloine are considerably broader than those of aloine, and have a richer yellow colour and a higher lustre. Brom-aloine is quite neutral to test-paper, is not so soluble in either cold water or cold spirits of wine as aloine, but dissolves very readily in hot spirits of wine.

- I. 0.421 grm. substance dried *in vacuo* gave 0.547 carbonic acid and 0.103 water.
 0.856 grm. gave 0.848 bromide of silver = 42.16 Br.
 II. 0.300 grm. substance gave 0.391 carbonic acid and 0.078 water.
 0.661 grm. substance gave 0.649 bromide of silver = 0.2762 Br. = 41.78 per cent.

Calculated numbers.		I.	II.
34 C	2550.00	35.73	35.43
15 H	187.50	2.62	2.71
14 O	1400.00	19.63	19.70
3 Br	2998.89	42.02	42.16
	7136.39	100.00	100.00

The brom-aloine employed in these analyses was prepared at two different times. It is plain therefore from these results, that this bromine compound is aloine, $C_{34}H_{18}$

O_{14} , in which 3 equivs. of hydrogen are replaced by 3 equivs. of bromine. The formula of brom-aloiné therefore is $C_{24}H_{13}O_{14}Br_3$.

When a stream of chlorine gas was sent for a considerable time through a cold aqueous solution of aloine, a deep yellow precipitate was produced. It contained a great deal of combined chlorine; but as it could not be made to crystallize, it was not subjected to analysis. In the present instance, and in those of several other feeble organic principles, such as orciné, chlorine appears to act somewhat too strongly, so that the constitution of the substance is destroyed, and merely uncrystallizable resins are produced. Bromine, on the other hand, is much more gentle in its operations, and usually simply replaces a moderate amount of the hydrogen in the substance, so that, as in the case of orciné and aloine, crystalline compounds are produced.

It has long been known to medical practitioners, that the aqueous extract of aloes is by far the most active preparation of that drug. The reason of this is now very plain, as the concentrated extract of aloes obtained by exhausting aloes with cold water consists chiefly of aloine, by much the larger portion of the resin being left undissolved. Mr. Smith informs me, that, from a series of pretty extensive trials, from 2 to 4 grs. of aloine have been found more effective than from 10 to 15 grs. of ordinary aloes. Aloine is, I should think, therefore likely ere long to supersede, at least to a considerable extent, the administration of crude aloes.

I endeavoured to obtain aloine by operating considerable quantities of Barbados, Cape and Socotrine aloes. These were macerated in cold water, and the aqueous solutions obtained were concentrated to the state of thin extracts on the water-bath. I was quite unsuccessful in every instance. The impurities contained in the extracts in these different kinds of aloes appear, when in contact with the oxygen of the air, to act upon the aloine so as effectually to prevent it from crystallizing. Aloine can only therefore be obtained in a crystalline state by concentrating the cold aqueous solution of aloes *in vacuo*; though, after the aloine has once been crystallized, and it is freed from the presence of those impurities which appear to act so injuriously upon it, the aloine may be quite readily crystallized out of its aqueous solutions in the open air.

Though aloine has as yet only been obtained from Barbados aloes, I have scarcely any doubt that it also exists both in Cape and Socotrine aloes. The amount of aloine in Cape aloes is, however, in all probability, much smaller than in either of the other two species; for Cape aloes is well known to be a much feebler cathartic, and to contain a mass of impurities. In corroboration of this opinion, I would refer to the fact already mentioned in a previous part of this paper, viz. that when aloine is digested with nitric acid, it is converted into Dr. Schunck's chrysammic acid. Now it has been satisfactorily ascertained that all the three species of aloes yield chrysammic acid, of which in fact they are the only known sources. Cape aloes, as might have been expected, yields by far the smallest amount of chrysammic acid together with much oxalic and some nitropicric acids. There appears, therefore, great reason to believe that all the three kinds of aloes contain aloine.

Since the above was written, I have learned from Mr. Smith that he has not succeeded in obtaining crystallized aloine from either Cape or Socotrine aloes. Mr. Smith does not doubt that both of these species of aloes also contain aloine, though, most probably contaminated with so much resin, or some other substances, as prevents it from crystallizing. What tends to confirm Mr. Smith in this opinion is the observation he has made, that when the crude crystals of aloine are allowed to remain in contact with the mother-liquor of the Barbados aloes, they disappear and become uncrystallizable. I have also observed a similar occurrence in the mother-liquors of tolerably pure aloine. These become always darker and darker; so that if we continue to dissolve new quantities of aloine in them, at length scarcely any of it crystallizes out, and the whole becomes changed into a dark-coloured magma.

In the year 1846, M. E. Robiquet published an account of an examination he had made of Socotrine aloes. By treating the concentrated aqueous solution of this species of aloes with basic acetate of lead, he obtained a brownish yellow precipitate, which was collected on a filter and washed with hot water. On decomposing this lead compound with sulphuretted hydrogen and evaporating the solution to dryness, he obtained an almost colourless varnish, consisting of a scaly mass, which was not in the least degree crystalline. M. Robiquet subjected his substance, which he called aloétine, to analysis, and obtained the following result :—

$$\begin{array}{rcl}
 8 \text{ C} & = & 27.7 \text{ per cent.} \\
 14 \text{ H} & = & 10.8 \text{ " } \\
 10 \text{ O} & = & 61.5 \text{ " } \\
 \hline
 & & 100.0
 \end{array}$$

It is plain therefore that M. E. Robiquet's aloetine, if it really is a definite organic principle, which I very much question, is certainly a very different substance from the aloine which has formed the subject of the present notice.—*London and Edinburgh Philosophical Magazine.*

EXPERIMENTS FOR ASCERTAINING THE PURITY OF SULPHATE OF QUININE.

BY M. GUIBOUT.

IN the course of the year 1850, the Medical Jury of the Northern Department, caused four bottles of sulphate of quinine to be seized which had been delivered at the Pharmacie of the Hospitals of Valenciennes; they stated it to contain a certain quantity of salicine. This sulphate bore the seal of a Paris manufacturer, and the School of Pharmacy here were desired to take specimens of it, and submit them to a chemical examination. The result of this examination was, that the sulphate, several bottles of which had been indiscriminately taken from a very great number, not only was found free from salicine and all other substances foreign to cinchonas, but, furthermore, that it did not contain the smallest portion of cinchonine. The experiments on this occasion, having presented a few new facts, we are induced to record them.

1. *Determination of the quantity of water.*—2.5 grammes of sulphate taken from a bottle, the contents of which were thoroughly mixed, were dried in a closet heated by boiling water. The loss was 0.39 grammes, answering to 15.6 per cent. of water, or to 7 equivalents and a-half. This quantity of water is that which is usually found in the half effloresced sulphate of commerce.

2. This sulphate does not redden on the addition of concentrated sulphuric acid, and does not contain *salicine*.

3. When concentrated sulphuric acid is added, it assumes a very pale greenish yellow colour, which might be supposed to indicate the presence of a small quantity of *phloridzine*. But as it does not undergo the least colouration when exposed under a receiver to the vapour of liquid ammonia, it is evident that that substance is not present.

4. This sulphate is very slightly soluble in cold spirit, containing 90 per cent. of alcohol; but it dissolves *completely and very rapidly on the application of moderate heat*. This experiment shows that it contains neither *gum*, *fecula*, *sulphate of lime*, *sugar of milk*, nor even *sugar*.

5. This sulphate is completely soluble with heat in water, acidulated with sulphuric acid; it therefore contains neither *fatty acid* nor *sub-resin*.

6. *Test by baryta.*—In order to ascertain if the sulphate of quinine contains *sugar*, *salicine*, *phloridzine*, *mannite*, &c., and to effect the separation one from the other of these substances, the addition of baryta water to the dissolved sulphate has been recommended; but whether we operate thus, or triturate the pulverized sulphate with an excess of baryta-water during some length of time, we can only succeed in producing a sub-sulphate of quinine, sensibly soluble in cold water, and partaking in common with quinine itself, of the property of becoming insoluble on the application of heat. In order to obtain the entire decomposition of the sulphate, it must be heated for half-an-hour with an excess of baryta-water; left to cool; a current of carbonic acid passed through the liquor, and then filtered. If the sulphate of quinine be pure the liquor should contain nothing, at least it has been so considered; but it does retain in solution a rather considerable quantity of quinine, which on'y becomes separated when the water which serves as a water-bath enters into ebullition. We discovered this fact when operating on the sulphate of quinine submitted to us for examination, and we have furthermore proved, that a very concentrated liquor, deprived of nearly the whole of the quinine which it contained, did not indicate the presence of *sugar*, *mannite*, *salicine*, or *phloridzine*. Unto the very last we only obtained *quinine*, which was entirely convertible into sulphate, and without *any colouration* on the suitable addition of sulphuric acid.

7. *To detect the presence of sulphate of cinchonine.*—With this view M. Liebig has recommended the following process:—1 gramme of sulphate of quinine is to be triturated in a porcelain mortar with 60 grammes of liquid ammonia; the whole poured into a bottle, and 60 grammes of sulphuric ether added. It is to be agitated several times, at intervals, and then left to repose. The quinine dissolves in the ether, but the cinchonine, if there be any, remains insoluble, floating between the two layers of ethereal and ammoniacal liquid.

This process appeared to us the most simple of all those proposed. But, as is also remarked by our colleague M. O. Henry, the cinchonine is not completely insoluble in ether, and as ammonia, employed in so great an excess, may also dissolve a certain quantity of alkaloid, we adopted the following modification of the process:—2.5 grammes of sulphate of quinine, taken from a perfect mixture of the sulphate contained in a bottle of 30 grammes, were introduced into a bottle with 15 grammes of liquid ammonia. After having thoroughly agitated the mixture, it was allowed to stand for twenty-four hours, in order to be certain of the entire decomposition of the sulphate. It was then heated in a water-bath, so as to almost entirely volatilize the excess of ammonia; then left to cool and thirty grammes of *pure* ether added. By agitation, the quinine rapidly and entirely dissolved, so that two superposed *transparent* liquids were in the bottle, namely, the water containing the sulphate of ammonia and the ether containing the quinine. This experiment, which is very accurate, proved to us that the sulphate of quinine submitted to our examination did not contain sulphate of cinchonine.

To assure ourselves of the value of this process, we repeated it, adding to two grammes of pure sulphate of quinine one decigramme of sulphate of cinchonine. The ether dissolved the quinine as readily as in the preceding experiment; but there remained an insoluble cinchonine residue, partly adhering to the inner surface of the bottle and partly in the form of an opaque layer, between the two liquids. This insoluble residue was so voluminous and apparent that a fourth or fifth part of sulphate of cinchonine added, would by this means be easily detected. It is furthermore very easy to obtain the cinchonine, and ascertain its weight, by removing the ether by means of a tube, replacing it by fresh ether, which again is to be removed; then collecting the residue on a small weighed filter, washing the bottle and the filter with distilled water, &c.

Besides several entire bottles of sulphate of quinine, weighed, and bearing the seal of the manufacturer, whose sulphate it was said was of great purity, the Professors of the School also examined a sample of the same salt taken from an open jar used for retail purposes. This salt did not redden on the addition of sulphuric acid, and dissolved completely in acidulated water. Treated with boiling alcohol, it left an insoluble residue, not very considerable, which was sulphate of lime. Treated with ammonia and ether in the manner we have above described, the solution of the quinine was almost instantaneous, but there remained (in two grammes of the sulphate employed) between the two liquids, *a white and opaque film*, which was probably cinchonine, the weight of which was but slightly perceptible in the test balance. There also remained at the bottom of the aqueous liquid a greyish and flocculent deposit of sulphate of lime; but the quantities of the two sulphates of cinchonine and of lime indicated by these tests were so minute, that they could not be considered as the result of a fraudulent addition.—*Journal de Pharmacie.*

ON IODIDE OF STARCH, ITS DECOLOURATION BY HEAT AND VEGETABLE CHARCOAL, AND THE ACTION OF IODINE ON CHARCOAL AND SAW-DUST.

BY M. MAGNES.

1. *On Iodide of Starch considered as a Pharmaceutical Product.*

I published some months since, in the *Medical Journal of Toulouse*, a memoir on soluble iodide of starch, which afterwards appeared in several other journals. Notwithstanding the criticisms of M. Brun Buisson, who limits himself to stating that in his case my process did not succeed; and notwithstanding the sharper remarks of M. Quesneville, or rather on account of his interested criticisms, which were without

foundation*, I feel confident of having successfully reproduced the iodide of the secret formula of M. Quesneville.

I have since thought that a product might be obtained, which if not superior to the iodide of M. Quesneville, would at any rate better answer to the name given by this Chemist to his compound, and I have prepared, in the following manner, an iodide of starch, not using torrifed starch for the purpose, but common starch slightly moistened :—iodine, one part ; starch, slightly moistened, nine parts.

After having thoroughly mixed these two substances, I introduced them into a glass matrass, which I then closed and heated for several hours in a bath of boiling water, taking care to agitate the substance very frequently.

The product of this operation, which I had slightly referred to in the memoir just alluded to, is in great part soluble in cold water, and entirely dissolves when submitted to the heat of a bath of boiling water. The solution is of an almost pure blue colour, of great richness, and has far less of the violet tint than that obtained with the iodide of M. Quesneville.

The two processes described have the great disadvantage of yielding products having the odour and flavour of iodine, which although but slight, are detected by sick persons. Washing with alcohol diminishes this objection, but does not entirely remove it. The same disadvantage exists in the product of M. Quesneville. A bottle of iodide of starch from the laboratory of this Chemist, gave off, in the space of a few months, sufficient iodine to impart a deep yellow colour to the cork which closed the bottle. Struck by these objections, I have prepared a medicine analogous to the iodide of starch, which appears to me to possess the advantages of the former, without partaking of its defects. I shall presently allude to it, and give the formula for it, preferring to sacrifice any profit which I might derive from it, to the pleasure of benefitting my cotemporaries.

Before proceeding further, I think it will be useful to mention what I have recently observed during the washing of iodide of starch with alcohol. This washing, which I had adopted in the first instance, on the authority of M. Quesneville, now ought to be rejected, for the following reasons : The first affusion of alcohol brings over a certain quantity, not of pure iodine, as M. Quesneville appears to think, but of strongly ioduretted iodide of starch. To be convinced of this, it is only necessary to add a few drops of solution of caustic potash to the alcoholic liquor, which is yellow, to see formed a tolerably abundant white precipitate of starch. A second affusion of alcohol produces the same result, and this will continue until there only remains on the filter a slightly ioduretted starch of a reddish tint ; the washings by boiling alcohol finish by depriving the starch of its iodine†. I have repeated the same experiments on the insoluble iodide of starch of M. Bonnewyn, and the results were somewhat similar. But the starch of this last-named iodide remaining on the filter, is almost insoluble in water, while the starch of the soluble iodide participates in its solubility in that menstruum.

The yellow colour which the alcohol assumes on contact with the iodide of starch might, until the present time, have caused it to be thought that this solution only carried off the iodine. This error would have been avoided if a certain quantity of water had been added to the solution. Water gives it a violet-rose colour, denoting the presence of starch, which is furthermore proved by the use of caustic potash. I have shown that the iodide of M. Bonnewyn and that of M. Quesneville, which differ as is known in the quantities of iodine, also differ in the nature of the starch which they contain ; this might readily have been foreseen. But, furthermore, the starch which is contained in the iodide of M. Quesneville is not in a uniform state. If this iodide of starch be successively treated by alcohol at 40°, by alcohol at 21°, and by water, the products of these three washings separated, and then the starch of the alcoholic liquors precipitated by potash, it will be found that the first precipitate assumes a rose colour on the addition of ioduretted water ; the second becomes violet, whilst the aqueous solution is blue.

* M. Quesneville did not take the trouble to repeat my process before condemning it. He based his judgment on the authority of Brun-Buisson, whom he ridicules a few lines afterwards, not perceiving that he thus destroys the only support of his argument.

† What now becomes of M. Quesneville's statement that the washing by alcohol only carries off the iodine existing in a free state in the iodide.

2. *On the Action of Heat on Iodide of Starch.*

Those authors who have studied the peculiar property possessed by the solution of iodide of starch, of becoming decolorized on the application of heat, have not always indicated the process followed in preparing the iodide of starch on which they experimented. They have furthermore operated on solutions containing but a small proportion of iodide of starch, being unable to procure any more concentrated. This twofold cause renders their statements on the subject less decisive and less susceptible of rigid exactitude than would otherwise have been the case. In my experiments on the iodide of starch, I used a solution prepared according to my first process.

I dissolved ten grammes of it in 250 grammes of distilled water, and heated the solution in a glass flask unto ebullition; some time before it arrived at the boiling point, the liquor gave off a large quantity of iodine; after boiling for three minutes, it lost its fine blue colour and assumed a slight colour of dead leaves; it was decidedly acid. On cooling, the primitive blue colour re-appeared, but it was less intense and approached a violet tint; the liquor again boiled for three minutes, gave off abundant vapours of iodine, lost its colour, and became more acid. When cool it assumed a vinous violet shade; a third boiling for the same period of time again caused a disengagement of iodine from the liquor, decolorized it more completely, and rendered it more acid; it became of a dirty rose colour when cool. Finally, a fourth ebullition of three minutes no longer disengaged iodine, but increased the acidity. Even after the lapse of an hour the cooling did not change the dead-leaf colour produced by the application of heat; but two months after the operation I have just described, the liquor had become of a vinous violet colour, and at the bottom of the bottle there was a slight violet-blue deposit. Was the acid formed in this experiment hydriodic acid? Several authors having denied its formation under similar circumstances, whilst others were of a contrary opinion, my first endeavour was to solve this difficulty.

I poured into a tubulated retort a certain quantity of solution of iodide of starch, which had been heated sufficiently to prevent change of colour on prolonged cooling; to the stopper of the retort were suspended a leaf of silver and a slip of moistened litmus paper. I then applied heat, and about three parts of the liquor distilled over without presenting any remarkable change; but then the litmus paper became red, while the silver retained its brilliancy. Soon afterwards the liquor became slightly yellow, I then withdrew the fire. The residue of the distillation was very acid, precipitated nitrate of silver abundantly, became of a reddish yellow colour on the addition of chlorine water, and threw down a very finely-divided black powder, on further additions of chlorine water. A large quantity of this reagent, however, caused the black precipitate to disappear and decolorized the liquor. A drop of this liquor tested with starch-paste before the addition of the excess of chlorine water, became of a deep violet colour. By these characteristics it was impossible not to recognize hydriodic acid.

It now remains to determine if it is from water or from starch that the iodine derives the hydrogen to form this acid. For two reasons, it appears to me, that the hydrogen is furnished by the water:—1. The contact of the water and the iodine produces hydriodic acid. This fact, first made known by Gay-Lussac, then verified by M. Lassaigue, has also been observed by myself.—2. In the modifications which starch undergoes under the influence of iodine, in passing first into dextrine and then into glucose, instead of losing its hydrogen it absorbs the elements of the water. This result is ascertained by the comparison of the formulæ of starch and glucose.

I have just stated, that under the prolonged influence of heat the iodine converts the starch into glucose. The following is the experiment on which I founded my assertion:—

I dissolved ten grammes of iodide of starch in 250 grammes of water, and heated the liquor for several hours, replacing the water as it evaporated. I then concentrated the liquor, which had become very acid, and I afterwards saturated it by potash. By means of concentrated alcohol I removed the iodide of potassium which was formed, and there remained a pitchy mass, which behaved itself like glucose when treated with lime-water and Bareswil's solution. However, this mass was but slightly sweet and contained dextrine. I now asked myself if the dextrine formed, in the first instance, under the influence of iodine, had been directly converted under the same influence into glucose, or if it had passed through the intermediate state of cane-sugar. I have vainly endeavoured, by numerous experiments,

to solve this question. Nevertheless, the transitory appearance of cane-sugar does not appear to me to be unlikely, especially as I have proved, as stated in the commencement of this paper, the transformation of cane-sugar into glucose under the influence of iodine and heat. This conjecture is further supported by an assertion made some time since by M. Dumas, to the effect, that when the reaction of diastase on starch could be stopped at the proper period cane-sugar might be produced. There is yet another point to be discovered relative to the formation of the glucose. It would be interesting to ascertain if the glucose is really formed by the action of the iodine, and if it would not be more correct to attribute its formation to the hydriodic acid which incessantly replaces the iodine.

I now have to explain the disappearance and return of the colour in the solution of iodide of starch, heated and cooled alternately several times. The disappearance of the iodine and the production of hydriodic acid are the most ready means of accounting for the decolouration, but these are far from explaining all. Indeed, if these were the only agents we should only find starch and hydriodic acid in the liquor, and the colour would not return. Is there an iodide of starch formed, colourless on account of an excess of starch? This has been thought by certain Chemists to be the case. M. Lassaigne has successfully supported this supposition, which furthermore readily accounts for the decolouration, but leaves inexplicable the return of the colour. It is more natural to think with that Chemist, whose authority I have just quoted, that the solution of iodide of starch, when under the influence of heat, assumes a peculiar arrangement of its molecules, which permits all luminous rays to pass freely through the liquid mass without colouring it, and that colour reappears, when cooling modifies this arrangement.* If the fact of the disappearance and return of colour, which, according to the explanation given, ought to be indefinitely prolonged, should cease, this might arise from the circumstance that the elements of the iodic composition separate or alter by the frequent application of heat. It is on account of the gradual disappearance of the iodine and predominance of the starch, which tends to pass more and more into the state of dextrine, that the successive colourations degenerate from blue to violet, and ultimately to dirty rose colour.

3. *On the Action of Charcoal on Iodide of Starch and on Iodine.*

Having seen in a memoir of M. Lassaigne's, whose works on iodine I have consulted with much advantage, that iodide of starch is decolourized by animal charcoal, it occurred to me to try the action of wood charcoal on this substance. The experiments I have made with this view have succeeded, and the decolouration of the solution of iodide of starch by means of vegetable charcoal was effected with ease and promptitude at the ordinary temperature. The charcoal absorbed the whole of the iodine separating the starch. I then conceived an idea of combining directly the iodine and the charcoal in convenient proportions to form a compound which would therapeutically replace the iodide of starch of M. Quesneville, the disadvantages of which I have above alluded to. The combination succeeded very well. Experience will prove if my aim, in a medicinal point of view, has been attained.

The ioduretted charcoal which I obtained is free from the taste and odour of iodine. Although under ordinary circumstances more solid than iodide of starch, it appears to me that it would very easily decompose under the influence of the moist heat of the stomach and vital forces. If it cannot be prepared as a syrup, it may readily be made into pills and tablets. These two latter forms are quite as convenient as the former. The following is the manner in which I operated in obtaining my ioduretted charcoal, and also the remarks I made on the occasion :—

* This explanation is further supported by the following observation :—"Many acids, especially hydrochloric and oxalic acids, do not produce any chemical action on iodide of starch; it is only known that their contact gives so powerful a cohesive property to the starch as to cause it to precipitate from its aqueous solution. If, then, these acids facilitate the return of the blue colour in a solution of iodide of starch decolourized by heat, may we not conclude that in destroying the arrangement of the molecules formed by the application of heat, they restore the colour? Thus without difficulty I would admit that the colour which re-appeared after the lapse of two months, in my solution of iodide of starch long exposed to heat, was due to the action of hydriodic acid and time, which had both contributed to destroy the molecular arrangement which prevented the manifestation of colour."

Willow charcoal, washed and reduced to fine powder	9 grammes
Iodine	1 gramme *
Distilled water	108 grammes

After a few minutes trituration in a porcelain mortar, the whole was placed on a filter, and the water passed through perfectly colourless and free from the flavour of iodine. It only colours starch-paste when chlorine water is added. Evaporated to dryness it leaves a residue weighing about one decigramme. This residue raised my curiosity, especially as I had washed the charcoal in a large quantity of water to remove the carbonate of potash contained in it, and thus prevented the formation of iodide of potassium. Also the liquor, the residue of which tested with starch-water did not become blue, but on the addition of a small quantity of chlorine-water, a fine blue colour was immediately produced. The addition of a drop of concentrated sulphuric acid produced the same result. Heated for an instant at a red heat, the residue gave off abundant vapours of iodine. Cooled, and again tested by chlorine and starch-water, it became blue. Heated a second time to a red heat, but for a longer period, it still gave off vapours of iodine, but weaker. After this, the reagents no longer denoted the presence of iodine. It became of a brilliant white, and was found to be quick-lime. The residue then, the chemical properties of which I have just described, is iodide of calcium, and the lime evidently is derived from the charcoal in which it would be found in the state of carbonate of lime.

In order to prevent the formation of iodide of calcium in the preparation of ioduretted charcoal, it is better to wash the charcoal first with hydrochloric acid, and then with water.

I dried the ioduretted charcoal in a moderately heated stove, but notwithstanding the slight elevation of temperature, the iodine, aided by the vapour of the water was in part given off. Seeking to remedy this inconvenience, I intimately mixed together one part of iodine with nine parts of dry charcoal, only retaining its hygro-metric water; so as to avoid having to dry the product. I succeeded better than I had anticipated, the product having neither the flavour or odour of iodine, and having washed it on a filter I ascertained that the water which passed through was inodorous and colourless, and that it did not give a blue colour to starch paste.

From what we have seen it appears that in order to obtain charcoal ioduretted to the extent of a tenth part of iodine and free from iodurets, we should use charcoal washed first in hydrochloric acid and then in water, dried in the open air, and simply mixed by means of trituration, prolonged according to the quantity of iodine.

The property possessed by vegetable charcoal of concentrating a large proportion of iodine in a small volume, appears to me to be capable of being usefully employed in the extraction of this metalloid. This same property might again on the contrary, become the cause of serious errors to those engaged in investigating criminal cases, who, after having decolorized by means of charcoal the liquids suspected of containing iodine, would not think of again seeking for this substance in the charcoal used.

4. On the Action of Iodine on Sawdust.

I pounded in a porcelain mortar three grammes of fresh finely powdered sawdust with two decigrammes of iodine, the mixture assumed a fine reddish yellow tint, resembling that of Chinese rhubarb powder. I added by degrees some distilled water, still continuing to pound it, and after a few minutes I put the whole of it on a filter. The liquor had neither the odour or flavour of iodine, it was of a fawn-coloured yellow, and did not colour starch water, unless chlorine water was added. Evaporated carefully to dryness, it did not give off any iodine. It was only when the heat was increased so as to slightly carbonize the residue that there escaped from the latter very abundant vapours of iodine. I then increased the temperature to a dull red heat, when a few scarcely perceptible vapours of iodine appeared; these soon ceased, and did not re-appear even at a white heat, they arose from a small quantity of iodide of calcium. When tested by starch paste and chlorine water the residue assumed a bluish tint: it was almost entirely composed of lime and iodide of potassium.

* The proportions of nine-parts of charcoal to one-part of iodine do not indicate the extent of the absorbent property of the charcoal. In the experiments I have made, four-parts of charcoal have absorbed one-part of iodine, but two-parts of charcoal did not absorb one-part of iodine. But these proportions are not absolute, and, doubtless, vary according to the nature of the charcoal and its division.

The disappearance of iodine from the time when the carbonization of the residue takes place, induces me to think that the iodine is at least partly combined with some vegetable matter. This combination is sufficiently intimate, as I have before stated, to prevent the starch from being coloured. In which portion of the vegetable matter is the iodine combined? Is it in the ligneous fibre or cellulose? Evidently not; for I have experimented on cellulose and confirmed the statement of several authors to the effect that iodine is indifferent to the action of cellulose. Is it to the nitrogenous matter contained in the wood? of which M. Dumas in his *Traité de Chimie*, vol. vi., page 4, says: "This nitrogenous matter assumes a yellow colour, and contracts when an aqueous solution of iodine is added." I am much inclined to support this opinion, as the sawdust on which I operated assumed a reddish yellow colour on contact with iodine.† But the whole of the iodine was not absorbed by this nitrogenous matter, as a portion was found in the liquor in the state of iodide of calcium and potassium.

The transformation of the salts of lime and potash contained in the wood into iodides under the influence of iodine, appears surprising; it is nevertheless probable, as we have already seen the carbonate of lime contained in the charcoal decomposed by iodine. I wished, however, to make a direct experiment to ascertain if acetate of potash, taking it as an example of salts of organic acid, is decomposable by iodine. With this view I rendered slightly acid some acetate of potash, wishing thus to avoid an excess of base, which would have rendered my experiment less satisfactory. I then poured a few drops of ioduretted water into the solution of acid acetate of potash, and agitated it briskly. When a solution of starch was added to this mixture it did not become coloured; but the addition of chlorine water caused it to assume a blue colour. It appears to me from this fact, and from the analogous facts before referred to, that we may conclude that the salts of organic acids and of potash and lime bases which are contained in sawdust, are partially transformed into iodides under the influence of iodine.

Whilst making the last-named experiment I discovered a curious fact. If a few particles of iodine are pounded with dry acetate of potash, the matter soon assumes an intense blue colour. In the first instance I thought I might have accidentally introduced a small portion of starch into the mixture; but the same experiment repeated several times with the greatest care always produced the same colouration. After the lapse of a few minutes the blue colour disappeared by degrees, and the liquor which was formed by the absorption of the humidity of the air was yellowish.

To avoid the accusation of plagiarism, and not to claim a title which properly belongs to M. Emile Béchi, a Chemist in Florence, who published a remarkable work on the combination of iodine and charcoal, which appeared in the July number of the *Journal de Pharmacie et de Chimie*, 1851, I must state that my researches on the subject were ended before I had read the memoir of M. Béchi. I did not in any way alter my manuscript after reading his paper. In the first instance I thought of abstracting from No. 3 all that might cause me to be accused of plagiarism; but being conscious of my innocence on this point, and further giving to M. Béchi the whole honour of the discovery of the action of iodine on wood charcoal, which he had the good fortune to publish before me, I strictly left my manuscript unaltered.

Furthermore, the object of my paper was essentially different from that of M. Béchi, and I only noticed as a corollary the possibility which I saw of applying, in the extraction of iodine, the affinity of this metalloid for charcoal. Even had the purport of my researches not been the discovery of a new medicine capable of re-

† This great affinity of iodine for nitrogenous vegetable matter, would explain the extreme richness in iodine of the fuci, confervæ, and lichens, &c., which are considered to be some of the most nitrogenous vegetables. On the other hand, the combination of iodine and the nitrogenous matter, which I am now studying, is destroyed when the carbonization of the compound commences. Have I not, therefore, some right to infer that the iodine is in the state of metalloid? and may we not naturally presume, in common with certain authors cited by M. Dorvault, but whose memoirs I do not know, that in the fucus the iodine is also in that state. If we further consider that it is scarcely probable that the fucus limits itself to the absorption of the iodides which are contained in sea-water, and that, on the contrary, it is more natural to believe that the fucus decomposes them, to appropriate to itself the iodine, in the same way that vegetables generally absorb carbonic acid, ammonia, and the silicates, to appropriate carbon, nitrogen, and silica, I shall be pardoned, I hope, for having revived an opinion, which has been combated; it is true, with much talent by M. Dorvault, but which, notwithstanding, appears to me to be retainable.

placing the iodide of starch, but the extraction of the iodine, I should not, I think, have adopted the rational, although very complicated, process of M. Béchi, but should have assayed more simple and direct means for the attainment of my object. In the first place, I should have tried a method practised by saltpetre-makers, of entirely saturating the charcoal with iodine; this substance, as I have before stated, easily combines with four parts of charcoal. This composition, so rich in iodine, should then have been treated by concentrated sulphuric acid, so as to convert it into iodine, and into carbonic and sulphurous acids; or I would have burned the whole of the carbon of the ioduretted charcoal, by passing in a suitably disposed distillatory vessel a current of air, sufficient to burn the carbon, and thus set free the iodine; and, if these two processes did not succeed, I should not have preferred the hydrated ferruginous oxide, and the manipulations this choice would necessarily have caused, but would have employed caustic potash (also indicated by M. Béchi, although less prominently) because the treatment of ioduretted charcoal at a high temperature in the open air yields iodide of potassium preferable to iodine in an economical and commercial point of view. Indeed, as is well known, nearly the whole of the iodine extracted in the manufactories is now transformed into iodide of potassium.—*Journal de Pharmacie*.

METHOD OF DETECTING TRACES OF PHOSPHORIC ACID.

BY MESSRS. STRUVE AND SVANBERG.

If a few drops of solution of phosphate of soda be added to a solution of pure molybdate of ammonia, the mixture heated, and an excess of nitric or hydrochloric acid added, there will be formed a bright yellow precipitate of quinti-molybdate of ammonia, having the following composition:—

Ammonia and water.....	9.488
Phosphoric acid.....	3.631
Molybdic acid	86.881

It thus appears that phosphoric acid has a strong affinity for molybdic acid, into the combinations of which it enters.

In producing the above compound, Professor H. Rose prefers the use of nitric acid to that of hydrochloric acid.

With regard to the molybdic acid which is thus used as a test for phosphoric acid, it may be made directly, by dissolving molybdic acid in excess of ammonia.—*Journal de Chimie Medicale*.

RESEARCHES ON THE DECOLOURIZING PROPERTY OF CHARCOAL AND SEVERAL OTHER BODIES.

BY M. E. FILHOL.

It is commonly stated that charcoal is the only simple body possessing the property of absorbing colouring matter dissolved in a liquid: it further appears from the works of MM. Bussy and Payen, that decolouration by charcoal is a purely physical phenomenon.

Several compound bodies (alumina, sulphate of lead prepared by the moist way, hydrate of lead) also partake of the property of decolourizing liquids; but it is generally considered by Chemists that the action exercised by oxides on colouring matter in the preparation of lacs, is chemical, differing in this respect from that of charcoal; nevertheless, Berzelius was of opinion that the decolouration effected by the oxides and metallic salts, resembled that produced by charcoal.

In the paper which I now submit to the judgment of the Academy, my object has been to prove,

1. That charcoal is not the only simple body possessing the property of decolourizing liquids: sulphur, arsenic, iron obtained by the reduction of the hydrated sesquioxide by hydrogen, are all possessed of decolourizing power.
2. That the number of compound bodies having an appreciable decolourizing power, are more numerous than has been thought, and that this power appears to depend much more on the state of division of these bodies, than on their chemical qualities.
3. That such bodies which easily appropriate one colouring matter, may have but little tendency to do so with another; thus, phosphate of lime from bones (artificially

obtained) scarcely decolourizes the sulphindigotate of soda, whilst it exercises a more energetic influence on tincture of litmus than does animal black.

4. That the decolouration, in the majority of cases, is a purely physical phenomenon; thus, the same colouring matter is absorbed by metalloids, metals, acids, bases, salts, and organic substances: it is easy, moreover, by employing suitable solvents to take again the colouring matter in an unaltered state from the body which had absorbed it.

I do not doubt but that these practical data may become the subject of applications useful to analytical chemistry and industry.

The following results, which I have extracted from my memoir, will give some idea of the energy with which certain decolourizing matters act.

My observations have been made by the aid of one of Collardeau's double lunette colorimeters.

The Decolourizing Power of different Substances, compared to that of Purified Animal Charcoal, reckoned as equal to 100.

	Litmus dye.	Sulphindigotate of Soda.
Charcoal	100.	100.
Pure hydrate of iron	128.90	1.97
Alumina	116.	9.91
Phosphate of lime	109.	1.97
Iron reduced by hydrogen	95.33	100.
Milk of sulphur	26.67	0.
Binoxide of manganese (natural)	88.90	13.80
Indigo	80.	13.50
Oxide of zinc	80.	6.55
Stannic acid	70.40	0.
Antimonic acid	66.66	1.97
Chromate of lead	70.40	2.92
Litharge	66.66	3.85
Sulphate of antimony (natural)	59.25	0.
Sulphate of lead	50.	13.80
Binoxide of copper	26.67	0.
Protochloride of mercury	22.22	0.
Sulphate of baryta (artificial)	50.	0.
Sulphuret of lead (artificial)	130.	16.67

Comptes Rendus.

ON THE DISTILLATION OF OIL OF CLOVES AND THE PREPARATION OF BENZOIC ACID BY MEANS OF SUPER-HEATED STEAM.

BY PROFESSOR E. A. SCHARLING.

THE use of super-heated steam has been advantageously applied in various branches of manufacture, such as the carbonization of wood, the distillation of mercury, the preparation of plaster of Paris, &c. There is, however, no use to which it has been more successfully applied than to the distillation of palm oil, coconut oil, tallow, and other fatty substances, used in the manufacture of Stearic candles, a manufacture which has now become of considerable commercial importance. There can be no reason to doubt that the use of super-heated steam may also be advantageously applied to the preparation of various Pharmaceutical products. The following is an account of some experiments made by Professor Scharling on the distillation of oil of cloves:—

On passing a current of super-heated steam into a metallic cylinder half-filled with bruised cloves and pieces of pumice-stone, the size of a pea, there were obtained from one pound of Amboyna cloves, of first quality, two ounces and a half of oil, together with as much water as made the whole produce up to eight pounds in weight. In operating in the same manner on a pound of Bourbon cloves, of first quality, two ounces of oil were extracted on the first day in four hours, and on continuing the operation on the following days an additional half-ounce of oil was obtained. This latter quantity of oil was nearly all contained in the first two pounds of water which came over. Thus in eight hours additional working, sixteen pounds of water were distilled over, without obtaining a larger result than that given in the first five hours of the preceding experiment.

A third experiment was then made on two pounds of Bourbon cloves, of second quality, and in the course of eight hours three ounces and three-quarters of oil and sixteen pounds of milky water were obtained. In order to collect the principal part of the oil contained in this milky water, and to ascertain whether any advantage would accrue from submitting the cloves to another distillation, all the different cloves which had been previously operated upon, together with the water drawn over, were placed in an ordinary still. On distillation, the first eight pounds of water gave about one ounce of oil. The water which came over afterwards was quite limpid, and after settling several hours no oil whatever separated from it. The apparatus employed in this distillation, consisted of a tinned brass cylinder pierced with holes, eight inches long and five inches in diameter, placed within another and larger cylinder seven inches in diameter; the space between the two cylinders being filled with husks of rice or other analogous material to prevent the escape of heat. To this apparatus is connected a Woulfe's bottle, containing a small quantity of water, one orifice of which communicates with the apparatus, and the other with a Liebig's condensing tube. The bottle is covered with flannel. It is thus evident, that with an apparatus as above described, and a due supply of super-heated steam, a large quantity of oil may be obtained in a short time with little expense.

Benzoic acid may also be prepared in the same way; about eight per cent. of the weight of the benzoin used being obtained. The odour of the acid furnished by this process is the same as that obtained in the ordinary manner.

Super-heated steam is readily obtained by passing a current of low-pressure steam through a coil of pipe, heated to such a point as to be capable of raising the temperature of the steam passing through it to the degree of heat required for the purposes of distillation.

ON OIL OF CLOVES.

BY GEORGE VON HEES.

1. Ten pounds of Amboyna cloves yielded in six distillations thirty-one ounces, sp. gr. 1.040.
2. Eight pounds of Bourbon cloves yielded in six distillations twenty-one ounces, sp. gr. 1.034.
3. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy-four ounces, sp. gr. 1.033.
4. Twelve-and-a-half pounds of Bourbon cloves yielded in six distillations thirty ounces, sp. gr. 1.043.
5. Twelve-and-a-half pounds of Amboyna cloves yielded in six distillations thirty-two ounces, sp. gr. 1.038.
6. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy ounces, sp. gr. 1.036.

These experiments show an average of the sp. gr. of 1.0375, and of the oil obtained from ninety-three pounds, two one-ninth ounces per pound. A quarter of a hundred weight of clove-stalks (*Stipit. caryophyll.*) yielded only sixteen ounces of oil of sp. gr. 1.049, differing considerably from the genuine oil in odour and colour. All these oils were first prepared by conducting a direct current of steam into the paste-like mass formed by the cloves with water. After the greater portion of water had gone over, it was cohobated, and the distillation continued from without, with condensed vapours of the pressure of three atmospheres.—*Archiv. de Pharmacie*, January, 1852, p. 41.

ON THE MANUFACTURE OF DRYING LINSEED OIL WITHOUT HEAT.

BY BARON LIEBIG.

WHEN linseed oil is carefully agitated with vinegar of lead (tribasic acetate of lead) and the mixture allowed to clear by settling, a copious white cloudy precipitate forms, containing oxide of lead, whilst the raw oil is converted into a drying oil of a pale straw colour, forming an excellent varnish, which, when applied in thin layers, dries perfectly in twenty-four hours. It contains from four to five per cent. of oxide of lead in solution. The following proportions appear to be the most advantageous for its preparation:—

In a bottle containing four-and-a-half pints of rain water, eighteen ounces of neutral acetate of lead are placed, and when the solution is complete, eighteen ounces

of litharge in a very fine powder are added ; the whole is then allowed to stand in a moderately warm place, frequently agitating it to assist the solution of the litharge. This solution may be considered as complete when no more small scales are apparent. The deposit of a shining white colour (sexbasic acetate of lead) may be separated by filtration. This conversion of the neutral acetate of lead into vinegar of lead, by means of litharge and water, is effected in about a quarter of an hour if the mixture be heated to ebullition. When heat is not applied, the process will usually take three or four days. The solution of vinegar of lead, or tribasic acetate of lead thus formed, is sufficient for the preparation of twenty-two pounds of drying oil. For this purpose, the solution is diluted with an equal volume of rain-water, and to it is gradually added, with constant agitation, twenty-two pounds of oil, with which eighteen ounces of litharge have previously been mixed.

When the points of contact between the lead solution and the oil have been frequently renewed by agitation of the mixture three or four times a day, and the mixture allowed to settle in a warm place, the limpid straw-coloured oil rises to the surface, leaving a copious whitish deposit. The watery solution, rendered clear by filtration, contains intact all the acetate of lead at first employed, and may be used in the next operation, after the addition to it as before of eighteen ounces of litharge.

By filtration through paper or cotton the oil may be obtained as limpid as water, and by exposure to the light of the sun it may also be bleached.

Should a drying oil be required absolutely free from lead, it may be obtained by the addition of dilute sulphuric acid to the above, when, on being allowed to stand, a deposit of sulphate of lead will take place, and the clear oil may be obtained free from all trace of lead.

ON THE STATE IN WHICH OXYGEN EXISTS IN THE BLOOD.

BY BARON LIEBIG.

ACCORDING to the opinions of some Chemists oxygen is not chemically combined with, but is merely absorbed by, the blood, and in proof of this opinion the fact is cited that the absorbed oxygen can be expelled by carbonic acid. This inference is however, according to the author, incorrect, and for the following reasons :—1000 volumes of water shaken with air and completely saturated therewith, absorb, according to Gay Lussac, only $9\frac{1}{2}$ volumes of oxygen and $18\frac{1}{2}$ volumes of nitrogen gas, while, according to the experiments of Magnus, 1000 volumes of blood will appropriate from 100 to 130 volumes of oxygen, and from 17 to 33 volumes of nitrogen. If the absorbed oxygen be contained only in one part of that fluid, that must be its water, which it is known under the same conditions absorbs from 11 to 14 times less oxygen ; the greater activity of its absorption by blood must be owing to some definite element which has a stronger affinity for oxygen than water possesses.

If the attractive power which the blood exercises towards oxygen be but slight, it does not thence follow that it is not chemically united. On the contrary, it is well known that the presence of one per cent. of phosphate of soda in water doubles its power of absorbing carbonic acid, over that of pure water at the ordinary atmospheric pressure. Solution of sulphate of iron will absorb forty times as much nitrogen as pure water can. Both of these solutions lose their gaseous contents in a vacuum, the former also by agitation with air, the latter by shaking with carbonic acid. It is hence obvious, and the conclusion applies to the blood, that absorption is greater in water holding salts in solution than in water alone.

A fluid then may be in two conditions, on either of which its absorbent power over gases may be dependent, viz., under pressure which condenses the gas, or chemical affinity exerted by its elements upon the gas.

If the oxygen of the blood were simply absorbed, then it must take up from the air, which contains only one-fifth of oxygen, twelve per cent. of oxygen ; double that proportion under twice the ordinary pressure ; treble, under three-fold pressure ; and if shaken with pure oxygen, it must receive five times as much. It has not yet been proved that the absorbent power of the blood varies with the alteration of atmospheric pressure. The researches of Regnault and Reiset have demonstrated that animals can live in an atmosphere abounding in oxygen ; and it is well known that in the neighbourhood of the Lake of Titicaco, in Puno (South Peru), 12,000 feet above the sea, 15,000 persons—and at Potosi, in Bolivia, at a height of 12,600 feet, 30,000 persons live and breathe as well as those who reside on the sea-shore. Now if the oxygen were merely absorbed by the blood, considerable influence must be exercised by the great differences in the amount of oxygen taken up.—*Chemisch-Pharmaceutisches Central-Blatt*. December, 1851.

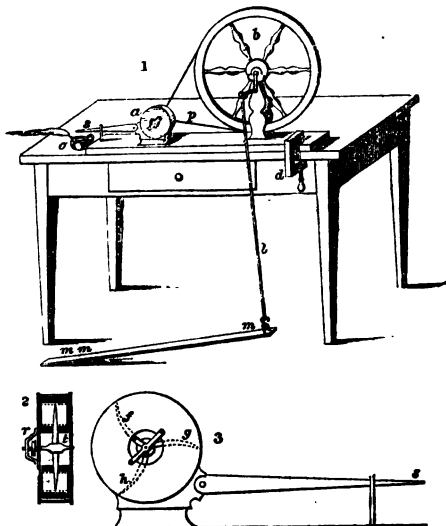
A CENTRIFUGAL GLASS-BLOWING MACHINE.

BY DR. TH. GERDING, OF JENA.

THE centrifugal blow-pipe, which has in recent times been so extensively employed in the arts, is as available for glass-blowing as it is useful for chemical purposes. Of this the author has convinced himself by having had a machine constructed for that purpose, and of which the following is a wood-cut.

The most essential parts consist of a cylindrical iron case *a*, and a wooden balance-wheel *b*; both of which are fixed upon a board about three feet long and four inches wide, which by means of a screw is fastened to the edge of a firm table. In the cylindrical case is fixed an horizontal axis (shown in fig. 2, *i*), to which the wings (fig. 3, *f*, *g*, *h*,) are attached.

The balance-wheel is brought into connexion with the axis by means of the cord *p*, which passes over a small pulley surface (fig. 2, *r*) placed outside the cylindrical case. The wheel is now set in rapid revolution (the operator taking his position before the mouth of the tube *s*) by the pressure of the right foot on the board *m* (at *m m*), which is connected to the handle of the wheel by a strong cord (*l*). By this means the axis enclosed in the iron cylinder will also be made to revolve with rapidity. The air



which enters the side of the cylinder at the point of junction of the axis is forcibly expelled by the action of the vanes or wings, through the orifice of the tube where it is directed over the flame of the oil-lamp, *o*. In this manner an intense heat is obtained, so that glass is melted with great facility.

If the operator does not like to use his own foot as the moving power, he can employ another person to turn the handle of the wheel.

The principal feature which recommends this machine is its capability of supplying a regular and uninterrupted stream of air; but besides this particular advantage, this machine has also the recommendation that it can be constructed at a very moderate cost.—*Archiv. der Pharmacie*, December, 1851.

SPECIFICATION OF PATENT

GRANTED TO GAIL BORDEN, JUN., of Galveston, Texas, in the United States of America, Manufacturer, for Improvements in the Treatment of certain Animal and Vegetable Substances, to render them more convenient for use as Articles of Food, and for their better Preservation. (Enrolled March 2, 1852).

THIS invention consists in combining flour, farina, vegetable meal, or pulverized biscuit, with the concentrated extract of raw parts of animal flesh, and in drying or baking the two substances in a drying chamber, or in an oven, thereby forming a portable desiccated meat bread or biscuit, which contains a large amount of nutriment in a very small bulk and convenient form, well adapted for seafaring purposes, armies, emigrants, travellers, hospitals, and family use.

Description of the Process.—I take animal flesh of any kind suitable for eating, that is fat and in good condition, and in order to extract all the nutritive juices, I macerate it by heat or steam, by boiling in a quantity of water, until all its nutritive or alimentary properties are given out in the decoction. I then strain this through

strainers of wire cloth, as a means of filtering the extract, which is further defecated by settling. The decoction or extract is reduced by evaporation, until it attains a state of spissitude about the consistence of thick treacle. This is done by means of steam, in a pan or tub, with a steam pipe coiled in the bottom, or by the vacuum pan, after the manner of making clarified sugar. Previous to, and during this operation, all the fat or oily matters which rise to the top of the decoction is skimmed off, or otherwise removed, and does not enter into the manufacture of the article.

With the animal extract reduced to the consistency above described, I mix good flour, farina, meal, or pulverized biscuit, made of good flour or meal, and a dough is formed, sufficiently stiff to be rolled into a convenient form, and cut into pieces by a common cracker or biscuit machine, suitable for drying or baking.

By mixing the flour or meal with the animal extract in a hot state, the dough becomes stiffer when cold, therefore, more convenient to handle or work, and more animal extract and nutriment will be combined with, and contained in, a given specific quantity of the flour or meal, which may, if preferred, be kiln dried.

I desiccate the dough as hereinbefore described, in a drying chamber, or bake it in a kiln or oven properly heated for that purpose. The heat employed may be about as great as a common oven would be after a batch of bread had been baked.

It should be baked slowly and with great care, until it becomes dry, about the common biscuit or cracknel dryness.

The biscuit thus made, may be ground into meal for greater convenience for cooking, and may be packed either in the cake or meal in air-tight casks or cases, or into tight bags of gutta-percha, varnished cloth, or other material fit for keeping out air, water, or moisture.

To make soup of the biscuit, it should be ground or pulverized, then stirred with a sufficient quantity of cold water to form a thin batter, in which it may stand from five to twenty minutes, then add it to boiling water, stirring frequently during the process, especially before it boils. The boiling should be continued from ten to thirty minutes according to the fineness of the biscuit-meal, and until it is dissolved in the water. Salt, pepper, or other condiment may be added to suit the taste. One ounce of biscuit will make a pint of good soup. Cooked vegetables may be added to the soup.

The excellence of the meat-biscuit depends on the quantity of animal nutritive matter employed in its manufacture. The extract should therefore be reduced by the process of evaporation, to about one-eleventh the weight of the flesh (including its proportion of fat and bone). This is the proportion in which fat and well-conditioned beef is used. I mix about two-parts of extract with three-parts of flour, equal to five-parts, but about twenty per cent. of the weight is lost in the baking.

The biscuits thus made are not liable to the attacks of weevils or other insects, to which other biscuits and kinds of food are subjected. The patentee states that he is aware that various processes have previously been adopted for preserving food, and after recapitulating the various purposes to which the biscuits are applicable, the facilities afforded for their preparation in the colonies and other places where meat is cheap, their portability and other advantages, concludes by claiming the process hereinbefore described, of treating animal and farinaceous substances, by combining the nutritive portions of flesh in a concentrated state with flour, farina, and meal, and drying or baking them in the form of biscuits, to render them more convenient for use, and their better preservation.

ON THE MANUFACTURE OF ANIMALIZED BISCUITS BY MEANS OF BUTCHERS' MEAT.

BY M. D'ARCET.

THE original invention of the meat biscuit must, however, be attributed to the French Chemist, M. d'Arcet, as is evident from the following extract from an article in the *Recueil d'Industrie*, which appeared about eighteen years since in the *Repertory of Patent Inventions*. We have here the fact stated that 400,000 meat biscuits were made and supplied to the French army. M. d'Arcet is well known for his researches in gelatine, to which he was accustomed to assign a more important place in the scale of nutritive substances than it perhaps deserved. The gelatine biscuits may not have answered the expectations formed of them; of this we have no account before us, all we can say is that the manufacture of meat biscuits was actually practised by M. d'Arcet.

In this process butchers' meat is converted into, first, soup-biscuits; secondly, gelatine-biscuits; thirdly, fibrin biscuits; and, fourthly, pot-grease biscuits well seasoned. The bones freed from their fat and gelatine form the sole residue of this operation.

100 kilogrammes (≈ 220.5 lbs. avoirdupois) of butcher's meat not freed from the bones furnish 200 litres (≈ 352 pints) of the best broth (*bouillon*) for families, and which may serve to make 400 broth biscuits.

There will remain, first, eight kilogrammes (≈ 17.6 lbs.) of pot-grease well seasoned; secondly, ten kilogrammes (≈ 22 lbs.) of bones; and, thirdly, forty-five kilogrammes (≈ 92.2 lbs.) of boiled meat or *bovilli*. Ten kilogrammes of bones will yield three kilogrammes of dry gelatine. These three kilogrammes of gelatine will serve to prepare 300 *gelatine biscuits*.

The forty-five kilogrammes of *bovilli* will be reduced by desiccation to twelve kilogrammes. These twelve kilogrammes of dried meat being pulverized, and employed in the quantity of ten grammes (≈ 154 grains) per biscuit, will form 1200 *fibrin biscuits*.

One hundred kilogrammes of meat, not freed from its bones, treated as I propose, may, therefore, yield first eight kilogrammes of pot-grease well seasoned, 400 broth biscuits, 300 gelatine biscuits, and 1200 fibrin biscuits.

All these biscuits will be animalized to the same degree, all of them containing ten grammes of dry animal substance per biscuit. It appears, beside, that an ox, yielding on an average 350 kilogrammes (≈ 772 lbs.) of butchers' meat, will be sufficient for the preparation of 6550 animalized biscuits. A biscuit should be composed of

Flour.....	325 grammes.
Dry animal matter	10 "
Water	100 to 120* "

This biscuit should weigh, being baked, 276 grammes. Two of these biscuits form the soldier's *ration*. It is evident, also, that in the case of which we are speaking this ration would contain a litre of family broth, or rather its equivalent in gelatine or fibrine, namely, in dry animal matter.

Manner of operating.—The broth will be made in the customary way. The bones are to be separated from the boiled meat, and the latter pressed by means of the hydraulic-press. A second broth is to be made with the boiled meat and the bones. This second broth is to be used instead of water for dressing a fresh quantity of meat. The boiled meat is to be pressed again in the hydraulic-press, and afterwards dried in a stove, and then pulverized in a mill or mortar. The gelatine is to be extracted from the bones either by means of hydrochloric acid or by steam. There will remain no more to be done but to separate the fat from the broth, to salt it to make it keep good, and to make the three sorts of biscuits mentioned above.

The 400,000 biscuits manufactured for the expedition to Africa were animalized with gelatine only. These biscuits contain, in animal substance, the equivalent for sixty-four oxen. A kilogramme of butchers' meat costs 0.6 franc at Toulon, or two francs at Algiers, obtaining it from live oxen conveyed thither.

A kilogramme of dried meat, put into biscuit at Toulon, will cost 2.5 francs at Algiers, whilst a kilogramme of dry meat, obtained from the animal on the coast of Africa, would there cost more than eight francs.

ADULTERATION OF BORAX.

We understand that there is at the present time in the market a quantity of adulterated borax, sold by a house at Wolverhampton, to which we think it right to call the attention of the trade. It contains 20 per cent. of *phosphate of soda*, which may be separated by exposing the sample to the heat of a drying-room for a few hours, when the phosphate effloresces and may be *picked out*—amounting to one-fifth of the whole. As a corroborative proof, solution of nitrate of silver may be added to a very dilute solution of 100 grains of the adulterated article, and then from the precipitated phosphate of silver the phosphate of soda may be calculated, which will equal 19.5 grains. This test is not perfectly accurate on several accounts; but affords a near approximation.

* It is obvious that, in order to manufacture broth biscuit, it is necessary to reduce by evaporation every litre (≈ 1.76 pint), so that it shall weigh no more than from 200 to 240 grammes (a gramme is equal to 15.434 troy grains.)

HOUSE OF COMMONS,

Wednesday, March 17.

THE PHARMACY BILL.—SECOND READING.

MR. JACOB BELL presented petitions in favour of the Bill from the President and Censors of the Royal College of Physicians, London; the President, Vice-Presidents, and Council of the Royal College of Surgeons; one signed by 150 eminent medical practitioners residing in London; and numerous petitions from medical practitioners, Chemists, and others in various parts of the country. He hoped the House would consider the above petitions, especially those from the two Colleges and the members of the medical profession, a sufficient answer to the allegation that there was no necessity for a Bill of this nature. It might be laid down as an axiom, that education in any branch connected with the profession of medicine was necessary, and repeated attempts had been made to supply the deficiency in the present law relating to Pharmaceutical Chemists. No doubt could exist as to the propriety of establishing an Examining Board, and ensuring the proper qualification of the members of that body, by means of an examination. Some difference of opinion had existed as to the jurisdiction under which such Board should be constituted, and about the years 1839 and '40, communications took place between the Chemists and the several medical bodies on this subject. It was proposed at one time to form a joint Board of Examiners with the College of Physicians, but after much discussion and consideration, this was found to be impracticable, and was abandoned. The College of Surgeons declined to entertain the question, and there were insuperable obstacles to an amalgamation with the Society of Apothecaries. The result of these deliberations was the establishment of the Pharmaceutical Society, consisting entirely of Chemists, as the institution which should regulate the education, and conduct the examination of the future members of that body. This Society, which was incorporated by Royal Charter in 1843, was entirely of a voluntary character; its powers did not extend beyond those who thought proper to come within its ranks, and only those young men who desired to distinguish themselves came forward for examination, consequently, the influence of the Society *numerically*, on those entering the business, was small, while the result of the system of education and examination, in the cases of those who availed themselves of it, afforded satisfactory evidence of its efficacy. It was therefore necessary, in order to extend that beneficial influence, to increase the powers of the Society, and for this purpose the Pharmacy Bill was introduced. The Bill confirmed the Charter of the Society, with certain modifications, and gave power to make bye-laws and other necessary regulations. It then enacted that it would be unlawful for any person to assume the name of Pharmaceutical Chemist, or Chemist and Druggist, &c., unless he had passed the prescribed examination, as a guarantee to the public that he was qualified to perform the responsible duty of dispensing medical prescriptions. There was a clause exempting from interference all persons already engaged in the business, as it would be unjust to make the Act retrospective in its operation. There was another clause, exempting all the medical bodies in the three kingdoms, the provisions of the measure being confined exclusively to Chemists and Druggists. The penal clauses were not nearly so stringent as those in other Acts of Parliament of a similar nature, as they only went so far as to prevent the public from being imposed upon by unqualified persons, and to recognize and establish a standard of qualification for those who assume the name and profess to be Pharmaceutical Chemists. The Bill was generally supported by the Chemists throughout the kingdom, and also by a large proportion of the medical profession. The only opposition which had arisen was from the Royal College of Surgeons, Edinburgh, and the Faculty of Physicians and Surgeons, Glasgow. The first objection was that it would obstruct the progress of a general measure for regulating the entire medical profession. This he (Mr. Bell) was prepared to refute, as it was one of the merits of the Bill that it did not interfere in any way with the existing medical and surgical bodies. Those who had had any experience in what is called medical reform must be aware that it is a most complicated and intricate subject, involving a great variety of interests and prejudices, and it had been the studious endeavour of the promoters of this Bill to keep it perfectly isolated and distinct. The medical profession might legislate independently, and the passing of this Bill would rather facilitate such

legislation than otherwise. Another objection was that too much power was vested in the Pharmaceutical Society, and that the bye-laws and regulations ought to be under the supervision of the Secretary of State or other officer of the Government. Now this provision had been introduced into the Bill of last session, but it was omitted in the present Bill on account of the indisposition of the late Home Secretary to have anything to do with it, under the idea, no doubt, that the question would be involved in the same intricacy as that of medical reform. This, however, was not the case. If it were thought right the clause which had been expunged could be re-introduced. Another objection was that the Bill would affect the licentiates of the above-named corporations, who have the power of granting licences for general practice, including the practice of Pharmacy. This, however, was a misapprehension, as the parties in question would be expressly exempted, and would enjoy all the rights and privileges that they would have possessed if the Bill had not passed. They could not, however, be registered as Pharmaceutical Chemists under the Bill, as that term was confined to "persons who dispense medical prescriptions and prepare medicines, not being members of the medical profession, or practising under a diploma or licence of a medical or surgical corporate body." These latter words were introduced by desire of the Apothecaries in London, and now he was required to take them out to satisfy the medical practitioners in Scotland. If he were to comply, and confer by the Bill new powers on the two licensing bodies who made the demand, a contention and rivalry would immediately arise between the practitioners in England and the practitioners in Scotland, which would hazard the passing of the Bill. It was necessary to confine the registry to Pharmaceutical Chemists, to make the institution strictly Pharmaceutical, and to avoid the confusion which would arise if Medical Chemists, Surgical Chemists, and Pharmaceutical Chemists, having different kinds of qualification, were all registered together on one list. In fact, the charter of incorporation defined the members to be Chemists and Druggists, and members of the medical or surgical profession were disqualified for admission as members of the Pharmaceutical Society. The Society of Apothecaries had fallen into the dilemma of gradually assuming the character of medical practitioners, and this had led to their abandonment of Pharmacy as their primary and principal pursuit, an example which the Pharmaceutical Society was desirous not to imitate. It was needless to discuss more in detail the minor provisions of the Bill, which would be duly considered by a select committee, in the event of the House acceding to the motion of which he had given notice. He felt assured that if the Bill should pass it would, in a few years, raise the character of Pharmaceutical Chemists. It would oblige all those who regularly follow the business to learn the rudiments of Chemistry and the collateral sciences. Among the number some would be found who, by their natural talent and industry, aided by the fundamental education rendered necessary by the Bill, would turn their attention to the higher branches of science, and reflect credit on the country. The majority, however, would confer a benefit on the public in another way, by performing in a more safe and efficient manner the duties of Pharmaceutical Chemists in the preparation of medicines, many of which are powerful poisons, and ought not to be entrusted in the hands of ignorant and inexperienced persons. He moved that the Bill be read a second time, for the purpose of being referred to a select committee.

The SECRETARY OF STATE (MR. WALPOLE), considering the great powers given by the Bill to the Pharmaceutical Society, was not prepared to give his assent to the second reading before the Bill had been referred to a select committee. The second clause gave very great and irresponsible powers to the Pharmaceutical Society in making bye-laws and regulations, and the fifteenth clause subjected persons to serious penalties for assuming the business of a Chemist and Druggist contrary to the regulations so laid down. Very difficult cases might arise on that question, unless the clauses were worded with exceeding care, and he hoped, therefore, that the committee, before whom the Bill should be sent, would be very careful in the construction of these clauses.

MR. BOUVIERE agreed with what had fallen from the Right Hon. the Home Secretary. Very grave objections could be stated to the Bill as it now stood. In fact, it would give a trading monopoly to a chartered body of which that House knew very little indeed. So far as he could understand the object of the Bill it was intended to turn Chemists and Druggists into Apothecaries, and to derive a revenue

for the Society by levying large contributions from Chemists already in business. The business now pursued by the Chemists was formerly carried on by the Apothecaries, also a trading body, to whom an Act of Parliament had given great powers; and unless great care were taken they would find a fresh crop of medical practitioners springing up among the Chemists.

Mr. BELL (in explanation) said, that the object of the Bill was diametrically opposite to that stated by the Hon. Member, and was about to explain further, but being called to order, he resumed his seat.

After a few words from Sir H. WILLOUGHBY, the Bill was read a second time, and ordered to be referred to a select committee, the SPEAKER having intimated that it was more regular to read the Bill a second time before sending it to a committee, and that the discussion on the principle of the Bill would be taken on the report being brought up in a committee of the whole House.

SELECT COMMITTEE ON THE PHARMACY BILL.

Mr. Ewart, Mr. Bouverie, Sir William Gibson Craig, Mr. Cardwell, Sir Henry Willoughby, Mr. Wakley, Mr. Deedes, Mr. Hindley, Mr. Jackson, Mr. Farrer, Mr. Wyld, Lord Burghley, and Mr. Jacob Bell.

PETITIONS IN FAVOUR OF THE PHARMACY BILL.

N.B. The figures in brackets denote the number of Petitions—M. Medical Practitioners—C. Chemists—P. Public.

From the President and Censors of the Royal College of Physicians; the President and Council of the Royal College of Surgeons; 151 Physicians, Surgeons, and Medical Practitioners of the Metropolis; the Professors, Assistants, and Students of the Pharmaceutical Society.

Alnwick (1) C.	Gaddeby (1) P.	Richmond, Surrey (3) M. C. P.
Ashby-de-la-Zouch (2) C. P.	Great Dalby (1) P.	Rochdale (2) M. C.
Audlem (1) P.	Gravesend (1) C.	Ruthin (1) M.
Bath (2) M. C.	Greenwich (2) C. P.	Ryde (1) C.
Basingstoke (1) C.	Halstead (1) C.	Rotherham (1) C.
Barnstaple (3) M. C. P.	Hartlepool (1) M.	Sandgate (1) M.
Blackheath (1) C.	Haslingden (3) C. M. P.	Scarborough (2) M. C.
Blackwater (2) C. P.	Hogthorpe (1) P.	Sheffield (1) C.
Blandford Forum (3) M. C. P.	Holywell (3) M. C. P.	Stalbridge (1) C.
Biggleswade (1) C.	Horncastle (1) C.	Stafford (3) M. C. P.
Birmingham (2) M. C.	Huntingdon (3) M. C. P.	Stourbridge (2) M. C.
Boston (3) M. C. P.	Ilfracombe (3) M. C. P.	Somerby and Burrow-on-the-Hill (3) M. C. P.
Bridport (2) M. C.	Ipswich (1) C.	St. Alban's (2) M. C.
Brighton (1) P.	Kingston-upon-Hull (2) C. P.	Stokesley (1) P.
Bristol and Clifton (1) C.	Knaresborough and Harrogate (1) C.	Stowmarket (3) M. C. P.
Bromyard (3) M. C. P.	Leamington (2) M. C.	Stalybridge (3) M. C. P.
Bury St. Edmunds (1) C.	Liskeard (2) M. C.	Swansea (2) M. C.
Cambridge (1) C.	London and its Vicinity (54) M. C. P.	Teignmouth (3) M. C. P.
Canarvon (3) M. C. P.	Ludlow (2) M. C.	Thetford (1) C.
Cirencester (1) C.	Leeds (2) M. P.	Thorp (1) P.
Clapham (4) M. C. 2 P.	Melton Mowbray (3) M. C. P.	Thirsk (1) C.
Colchester (1) C.	Middlesborough (1) C.	Tewkesbury (3) M. C. P.
Collumpton & Bradninch (1) P.	Mossley (1) P.	Torquay (3) M. C. P.
Congleton (1) C.	Newcastle-under-Lyne (1) C.	Wakefield (1) C.
Coventry (3) M. C. P.	Norwich (2) M. P.	Warminster (1) C.
Crowkerne (2) C. P.	Oldham (1) P.	Welshpool (1) C.
Darlington (1) C.	Peterborough (3) M. C. P.	Wellington (1) C.
Dorchester (1) C.	Plymouth (1) C.	Wolverhampton (1) C.
Dorking (1) C.	Putney (3) M. C. P.	Woodbridge (3) M. C. P.
Edinburgh (3) M. C. P.	Preston (2) C. P.	Worcester (2) C. P.
Elgin (2) M. P.	Reading (1) C.	
Exeter (3) M. C. P.		
Glasgow (1) C.		

[We have heard that several other Petitions have been sent, but have not yet been presented.]

PETITIONS AGAINST THE BILL.

From the Royal College of Surgeons, Edinburgh.

From the Faculty of Physicians and Surgeons, Glasgow.

In case of any omission in replies by post, we acknowledge communications respecting the Pharmacy Bill from: Dr. Gardner, Edinburgh; Dr. Thompson, Glasgow; Dr. MacLagan, Edinburgh; Messrs. Foster, Collumpton; Elliott, Liskeard; Roberts, St. Albans; Abrahams, Liverpool; Bland, Stourbridge; Mackay, Edinburgh; Knight, Cirencester; Teasdale, Darlington; M'Farlane, Edinburgh; Acomb, Knaresborough; Simonds, Boston; Ritson, Sunderland; Owen, Canarvon; Gibbons, Plymouth; Cronshey, Thetford; Hopwood, Richmond, Surrey; Fowke, Stafford; Booth, Rochdale; Hitchcock, Taunton; Murdoch, Glasgow; White, Leamington; Cotton, Barnstaple; Beach and Barnicot, Bridport; Thompson, Thirsk; Pratt, Bradford; Francis, Woodbridge; Cousins, Oxford; Bailey, Wolverhampton; Clarke, Richmond, Surrey; Parkin, Hull; Tillman, Devonport; Smith, Woodbridge; Hick, Bradford; Hollier, Dudley; Smart, Enfield; Harris, Redruth, Cornwall; Lodge, Torquay; Hart, Derby.

MEETING OF CHEMISTS AT MANCHESTER ON THE PHARMACY BILL.

A MEETING of Chemists and Druggists was held on Monday afternoon in the B Committee Room, Town Hall, to consider the Bill now before Parliament for the regulation of Pharmacy. Mr. Thomas Standring was unanimously called to the chair. In addressing the meeting, he described the various measures which had been before parliament, from the passing of the Apothecaries' Act in 1815 to the present time, and drew attention to the principal clauses of the present Bill.—Mr. James Woolley advocated an improved education, scholastic and scientific, as the great want of the trade. With the facilities for applying scientific knowledge which the various branches of the trade afforded, a higher standard of intellectual acquirement would raise not only the social position, but advance the material interests of the body.—Mr. W. R. Brown moved the adoption of a petition in favour of the Bill, which he advocated as calculated, without interfering with any other body, to elevate the position of Druggists.—Mr. J. R. Lynch seconded the motion, and it was unanimously agreed to.—Mr. James Robertson moved a vote of thanks to Mr. Jacob Bell, M.P., for his disinterested and untiring labours to advance the general interests of the trade.—It was seconded by Mr. R. G. Mumbray, and carried unanimously. After the appointment of a local committee, and the transaction of some routine business, the proceedings terminated with a vote of thanks to the chairman.

WOLVERHAMPTON DISTRICT COUNTY COURT.

COD-LIVER OIL PILLS.

BAKER v. LANGMAN.

MR. KETTLE, on behalf of the plaintiff, stated, that although the action was brought to recover a small sum (2s. 9d.) being the price paid to Mr. Langman for certain boxes of pills, yet the question was of great public importance, as it was the object of this action to expose and prevent the continuance of a gross fraud. He should prove that the pills were utterly useless for the purpose for which they were recommended—that their composition was not as stated—and that they were not as represented, "Sir James Murray's Pills." The handbill in which the pills were enveloped, commenced as follows:—"Under Royal Patronage. Consumption curable by the use of Sir James Murray's Concentrated Cod-Liver Oil Pills." The bill proceeded with an encomium on Sir James Murray's "Concentrated Fluid Magnesia," and went on to say, that "happily for the public he had succeeded, by a process known only to himself, in concentrating the whole of the medicinal properties of the finest oil into four pills." These pills were "offered to the well-thinking public for the cure of coughs, colds, influenza, asthmas, consumption, and all diseases of the chest and lungs." "In consumption two pills should be taken every four hours with a tea-cupful of linseed or dandelion tea after each dose."—The author of the document proceeds to say, "It may be added here that this medicine is so perfectly innocent that it may be given to an infant immediately after birth." He (Mr. Kettle) would prove that these statements were founded in fraud and a gross imposition on the public. The pills contained no cod-liver oil. (His Honour observed that it was not necessary to prove that; but after some conversation it was agreed that Mr. Kettle should proceed with the case as he had proposed).

Thomas Baker stated, that on the 15th of November he went to Mr. Langman's shop and asked for "Sir James Murray's cod-liver oil pills," and received a box, for which he paid 4½d. He asked Mr. L. whether they were as efficacious as the cod-liver oil itself, and the reply was, "Quite as much, and more palatable to take." He had bought several other boxes of the pills subsequently, amounting in all to 2s. 9d. In cross-examination he stated, that he had formerly carted goods for Mr. Bailey, and had seen Mr. Bailey in reference to the purchase of the pills. Mr. Gibbons, the manager for Mr. Bailey, told him they were not Sir James Murray's pills. He then said, "If they are not Sir James Murray's, I'll go and see if they will try to impose upon me." He was sure he did not take any of them. Mr. Gibbons had

paid him the 2s. 9d. which he had paid for the pills. He had not returned them nor tendered them to Mr. Langman.

Sir James Murray stated, that he resided at Dublin. He was the inventor of the process of making fluid magnesia, and continued to make it. Mr. Bailey was his agent in that district (Wolverhampton). He had never concentrated cod-liver oil into pills. It was a monstrous fraud to say that it could be done. He had never sanctioned the use of his name in connection with any such deception. He had analyzed some of the pills. They contained no cod-liver oil, but oil of bitter almonds, and other ingredients giving out a garlicky smell on the addition of hot water; but the smell of the prussic acid overcame all the rest. A pennyworth of the stuff might be made into a poundsworth of the pills, but they would not be worth a penny still. The makers knew that they were cheating the public as much as if they were issuing forged bank notes. It was a monstrous calumny on him to use his name in connection with those pills. The prussic acid was enough to poison an infant, and the pill would choke it. To issue such a placard was villainous, absurd, and monstrous. There were a thousand villains substituting a thousand forgeries for his magnesia, but there was no villain who ever substituted anything so bad as these pills.

Mr. Turner, Chemist, in the employ of Mr. Bailey, deposed that he had analyzed the pills, and found they contained no cod-liver oil, but oil of bitter almonds, liquorice, and gum ammoniacum.

His Honour observed, that it was quite possible Mr. Langman might have been deceived by those from whom he had purchased the pills, but he must say that there was no fraud more dangerous than that such pills should be offered to the public. All that was necessary to sustain the action, was to prove that these pills were sold as "*Sir James Murray's Pills*."

Mr. Whitehouse (for the defence) was about to make some remarks, when *His Honour* again said he did not impute anything to Mr. Langman. He might have bought them and sold them without knowing the composition.

Mr. Kettle proposed the cross-examination of Mr. Langman; and Mr. Whitehouse called in question the liability of his client. After some arguments on both sides, *His Honour* intimated that Mr. Whitehouse had better not say any more. It was quite clear that the pills were utterly worthless and falsely described. If he went into a grocer's shop and asked for three pounds of moist sugar, and was supplied with sand instead, had he not a right to recover back the money which he had paid?

Verdict for the plaintiff with costs.

NOTICES OF BOOKS RECEIVED.

THE LONDON UNIVERSITY CALENDAR, 1852. Richard Taylor.

EXPERIMENTAL RESEARCHES IN ELECTRICITY (Twenty-eighth Series). *On Lines of Magnetic Force; their definite Character; and their distribution within a Magnet and through Space*. By MICHAEL FARADAY, Esq., D.C.L., F.R.S., &c. From the *Philosophical Transactions*, Part I. for 1852. London: Richard Taylor.

THE LONDON, EDINBURGH, AND DUBLIN PHILOSOPHICAL MAGAZINE AND JOURNAL OF SCIENCE. (Fourth Series.) London: Richard Taylor.

COPY OF A REPORT OF THE PROCEEDINGS AND EVIDENCE given upon Oath before the Judicial Committee of the Privy Council, on the Petition of SIR WILLIAM BURNETT, K.C.H., K.C.B., F.R.S., &c., for an Extension of his Patent for the Preservation of Timber, Canvas, Cordage, Cotton, &c., from Dry-rot, Mildew, Moth, and Premature Decay. 1852.

ANNALS OF INFLUENZA, OR EPIDEMIC CATARRHAL FEVER IN GREAT BRITAIN, FROM 1510 TO 1837. Prepared and Edited by THEOPHILUS THOMPSON, M.D., F.R.S., &c. 8vo, pp. 406. London: Printed for the Sydenham Society, 1852.

A LETTER TO THE RIGHT HON. SIR GEORGE GREY, BART., M.P., &c., ON MEDICAL REGISTRATION, and the Present Condition of the Medical Corporations. Second Edition. With Notes and Abstract of a proposed General Medical Registration Act. By EMERITUS. London: Jackson, 1852. (3 Copies.) ||

FOURTH REPORT OF THE SOMERSET COUNTY ASYLUM FOR INSANE PAUPERS. From 1st January to the end of the Year 1851. Wells: Green, 1852.

TO CORRESPONDENTS.

ESSENCE OF BEEF.—*P. F. S.* (London).—The liquid sold under this name is a kind of "stock," of which beef-tea and soup may be made in a few minutes. It is a very useful and convenient preparation for invalids. A quarter-pint tin, price one shilling, makes two or three pints of soup by the addition of water and seasoning. Prepared by Hogarth and Co., Aberdeen, and is sold in Cheapside.

A Constant Reader.—If properly prepared, the mixture is of a brown colour, with rather a copious precipitate.

J. A., R. A. P. S.—Syrup of tolu. We never detected the odour mentioned, but suppose the syrup must have undergone decomposition.

A. V. James (Carmarthen).—In the formula given, in which camphor and chloroform are ordered, camphor in substance, and not spirit of camphor, should be used.

B. G. (An Associate).—Chloroform is not strictly speaking a spirit, but in its general characters it resembles a heavy volatile oil.

An Amateur (Durham).—No.

Amicus.—(1.) Balfour's *Manual of Botany*.—(2.) Use of carbonate of magnesia in making cordial waters? It effects the minute division of the oil, but is objectionable for reasons stated, vol. iv., page 559.

Amicus (Camden Town).—(1.) We have not the formula for Stephens's black writing fluid.—(2.) Soluble Prussian blue is prepared by adding a persalt of iron to a solution of prussiate of potash, keeping the latter in excess, and washing the precipitate until it begins to dissolve in the water.

R. V. M. V.—Mineralogy, as far as it is involved in the study of Chemistry and Pharmacy, is included in the course of education at the Pharmaceutical Laboratory.

Josephus.—It is not probable that the work in question will appear shortly.

Economy.—It would be false economy to issue the mutilated labels in question.

R. (Liverpool).—The objection raised by our correspondent against the exposure of adulterations, is in a great degree removed, if the mode of detection be published at the same time. (This answer was omitted last month).

D. W. Y. (Preston).—(1.) Assistants of the present time are exempted.—(2.) They will not be compelled to undergo examination, but will find it to their advantage to do so.—(3.) It is probable.—(4.) See our Number for February and March.

F. J.—Associates of the Society can have books, but must apply through a Member, as they have in general no settled residence.

K. X. Y.—Because those who know the fact do not communicate it to the [proper authorities.

B. F. L. (Manchester).—See vol. iv., page 245.

Omega.—(1.) The solution should be clear, though a portion of the oxide may remain undissolved.—(2.) See vol. ii., No. 9, page 388.

J. P. S. (Rotherham).—(1.) *Empl. cerati saponis*.—(2.) We have no specific.—(3.) We have never examined the quack ointment alluded to.

J. L. G.—Camphor ball or glycerine for chapped hands.—(2.) We are not in possession of formulæ for universal specifics.

Omega.—The specimen sent is pure tartaric acid.

Lagos has called our attention to a typographical error in the answer to *Scoticus* in the last number of this Journal, at page 431, where the proportion of iodide of iron in the *Syrupus Ferri et Quinae Iodidi* is stated to be three grains in 3j, instead of three grains in 3i. The iodide of iron is reckoned in the state of hydration, in which it is used as solid iodide.—*B. C. A.* (1.) *Robinson on the Teeth*.—(2.) No.

A. T.—We do not undertake to perform analyses for our correspondents.

T. F. H. (Newcastle).—The papers have been received.

ERRATA.—Vol. xi., No. 9, page 431, last line, for "3i," read "3i."

M. Zimmer requests a notice of the following. By spirit of ammonia is meant liquor ammoniæ *P. L.*—In the process for detecting quinidine and cinchonine, the twenty drops of liquor ammoniæ should not be added with the sixty drops of sulphuric ether, but afterwards.—In the next paragraph but one, the word *pure* should be inserted before quinidine. The following paragraph "If more than a tenth of quinidine or any cinchonine at all," &c.—By "*sal-ammoniac*," last paragraph, is intended any salt of ammonia.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, Secretary, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho. Other communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. XI.—MAY 1st, 1852.

THE PROGRESS OF THE PHARMACY BILL.

IN consequence of the delay occasioned by the Easter recess, the Select Committee on the Pharmacy Bill has not concluded its labours. Five sittings have been held, during which evidence has been received from Physicians, Surgeons, and General Practitioners connected with the several colleges and corporations in London and Edinburgh, and from representatives of the Pharmaceutical Society. Evidence has also been taken on the laws relating to Pharmacy in France, Germany, Sweden, Finland, the Mauritius, &c.

The comparison thus instituted is by no means favourable to the character and credit of our own country. The Pharmaciens or Apothecaries on the continent of Europe (who represent the class of Chemists and Druggists in England) are obliged by law to pass through a regular education extended over several years, and comprising all the subjects required for the due performance of their functions, and the practical application of this knowledge in a shop. The examinations (in some countries three in number) are searching, and occupy several days. This education and the examinations are conducted in institutions under the direct control of the Government. No person can practise Pharmacy without possessing a diploma or licence, obtainable only after examination. In some instances the number of shops is limited, and no new shop can be opened except by licence from the Government. The prices of medicines are fixed by the authorities, according to a tariff, a discount being allowed to the poor. The shops are visited at intervals, bad medicines thrown away, and unless the regulations which the law requires are found to have been complied with, the offender is liable to punishment. The sale of poisons is placed under strict rules. They can only be sold by the authority of a medical practitioner or a Government inspector, and must be kept in a distinct part of the shop. A general disposition prevails to separate Pharmacy from medical practice. In some countries this is strictly enforced; medical men are prohibited under a penalty from selling medicines, and pharmaciens from practising as medical men. There are some exceptional cases: for example, in villages where the division of labour could not be carried out, medical men may sell medicines on obtaining a licence from the Government authorities, and in cases of emergency, or the necessities of the poor, Pharmaciens occasionally administer remedies according to their judgment. But this is done to so limited an extent, that it does not amount to an abuse, and does not appear to occasion jealousy in the medical profession. In some of the details, the laws vary in different countries, but the above is a very brief general outline of the regulations on the continent of Europe and in the Mauritius, which originally derived its laws from France. From the attention, which is paid to scientific education, it results that many eminent men rise from the rank of Pharmaceutical Chemists in these countries, profiting by the early tuition which forms the groundwork of their acquirements, they proceed in the several branches of science which are suited to their taste and ability, until they have obtained a celebrity creditable alike to themselves and to their country.

Turning from this glance at Foreign Pharmacy to the condition of that branch of the profession in Great Britain, the contrast is humiliating. We have some clever practical men of business fully competent for their duties as dispensers of medicine, we have some self-taught Chemists engaged as manufacturers, either separately or in conjunction with the dispensing business, and we have an indefinite number of pretenders to the rank of Pharmaceutical Chemists, possessing no education whatever, arrogating to themselves the insignia and titles of qualified men, frustrating the intentions of medical practitioners, and endangering the lives of Her Majesty's subjects. Whatever

qualification is possessed by any of these parties is more than the law requires—as the law requires nothing.

It is needless to recapitulate the disadvantages resulting from this defective state of the law, as these have been frequently adverted to in this Journal. The facts of the case are now before the Select Committee, with the Bill which has been prepared as a remedy for the evil, after many years of consideration and experience.

The laws on the Continent to which we have referred contain some severe restrictions, and a system of centralization and monopoly, which would not suit the habits and prejudices of Englishmen. These provisions are avoided in the Pharmacy Bill, which contains only those elements of improvement which are calculated to produce the desired effect without interference with our national and constitutional peculiarities. Some objections, however, have been urged against the Bill under the impression that it would interfere with the privileges of certain Medical bodies, and on other grounds which we have already pointed out, and amendments have been proposed to meet them.

The notions which we have heard in some quarters respecting the supposed monopoly created by the Bill are worthy of remark. The Bill creates no monopoly so far as the Medical Profession is concerned, as its operation does not extend to prejudice or affect the several licensing bodies comprised in the profession, or their licentiates. Nor does it establish a monopoly on the other side by prohibiting the sale of drugs by small shopkeepers, not regular Druggists. But it simply recognizes the class for whose education it provides, as a body qualified to assume the name and carry on the business of Pharmaceutical Chemists. The monopoly, if there be one, is in the assumption of a name or emblem implying qualification. The public may purchase medicines where they please; but if they go to a person who is not qualified, they are not to be deceived by the display of that which is usually taken as evidence of qualification, they employ a person not recognized as a Chemist with their eyes open and at their own peril. This distinction between the regular and irregular vendor of medicines will serve as an inducement to all those who embark in business as *bonâ fide* Chemists and Druggists to pass through the ordeal which the safety of the public requires in order to place themselves on the rank of recognized Chemists. It will thus raise the qualifications of that body, without fettering the sale of common medicines in small villages by the jack-of-all-trades, who deals in every thing. But it is objected that the exclusion of medical men from the register of Chemists and Druggists is an act of monopoly. This exclusion is intended as one mode among others of promoting the separation of the two bodies, insuring the continuance of the Pharmaceutical Society as a strictly Pharmaceutical body, and thus avoiding the example of the Society of Apothecaries, which has become a medical body. Medical men can perform all the functions of Chemists and Druggists in their own capacity, as medical men whose education includes Pharmacy. They can assume the name of Chemist, &c., the prohibition against this assumption having been removed from the original Bill in compliance with the wishes of parties who raised an objection to it. Having retained the power of practising Pharmacy and of assuming the name, some are still not satisfied because they are not to be included in the register. What they would gain by such inclusion it is difficult to understand. They claim to be considered a superior body, yet they are aggrieved at not being included on the register with those whom they view as inferiors.

Again, how can this desire to amalgamate themselves with the pharmaceutical body be reconciled with the apprehension lest that body should become medical? What could tend more to promote the assumption of a medical character than the inclusion of medical men into the ranks? They are excluded in order to maintain the separation, and secure the purely pharmaceutical character of the Society. Yet it is alleged, on the other hand, that the Bill is an invasion of the province of the Medical profession, and that the elevation in the

character of Chemists will cause them to become Medical Practitioners. It has been repeatedly stated in the most positive terms that the intention and tendency of the Bill are exactly the reverse, that Medical men are even excluded from the Pharmaceutical body, and that it is one of the objects of the Bill to create a separation so far as may be found practicable between Pharmacy and Medical practice in a manner satisfactory to all parties. We cannot understand on what principle the improved education of Chemists, as *Chemists*, can be objected to on the ground that this is an invasion of the Medical profession. Several Medical Practitioners who object on this ground have been requested to attend the Committee and explain in what manner this evil is likely to result from the Bill, and how the evil may be averted.

The questions at issue being under the consideration of the Select Committee, we trust that a mutually satisfactory arrangement will be effected. We are not at present in a position to predicate what may be the decision of the Committee on these questions, but the Bill, in its amended form, will be reprinted, and the opportunity will be afforded for the reconsideration of the entire measure. We do not at present anticipate any serious alterations in the Bill, as nearly all the objections we have heard are founded on a misapprehension as to its objects and intended operation.

PROCEEDINGS UNDER THE APOTHECARIES' ACT.

(55 Geo. III., cap. 194.)

We have reported the Rotherham case (page 532) at greater length than we should otherwise have done, because it is one of those cases which has already been and will hereafter be cited as a precedent against Chemists and Druggists. To what extent the precedent is applicable, will be seen from the following facts:—

The defendant in the Rotherham case is not, correctly speaking, a Chemist and Druggist. He is a half-fledged Apothecary. He served a five years' apprenticeship as an Apothecary to Dr. Shearman. He afterwards served four years as assistant, and received a testimonial declaring him to be fully qualified to take any similar situation. In fact, he went through the preliminary portion of a medical education, but instead of completing his studies and obtaining a licence from the Society of Apothecaries, he commenced practice on his own account, without any legal qualification, under the title of Chemist and Druggist.

Under this title he might have claimed, by the 18th section of the Apothecaries' Act, exemption from all interference on the part of the Society of Apothecaries in carrying on the trade or business of a Chemist and Druggist, "in such manner as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by Chemists and Druggists before the passing of this Act." This, however, was not his object or intention. He had been brought up as an Apothecary, he visited patients, felt their pulse, applied the stethoscope, prescribed and furnished the medicine to all intents and purposes, in the capacity of an Apothecary or general practitioner. The defence was not founded on the 28th clause above referred to, but on his alleged fitness and qualification to act as a medical practitioner, and on the allegation that his advice was gratuitous, although included in the charge for medicine, according to the custom of Apothecaries.

It is, therefore, clear that the defendant exceeded the limits within which he might have claimed exemption as a Chemist and Druggist—that he was a Medical Practitioner in disguise, and that the precedent furnished by this case is not applicable to persons carrying on the trade or business of a Chemist and Druggist in such manner as fully and amply as the said trade or business was used, exercised, or carried on by Chemists and Druggists before the passing of the Act.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

PHARMACEUTICAL MEETING,

Wednesday, April 14, 1852.

MR. HERRING, PRESIDENT, IN THE CHAIR.

The following DONATIONS TO THE LIBRARY AND MUSEUM of the Society were announced :—

Salmon's *Dispensatory*, 1696, from Mr. May, Tonbridge Wells.

The *Literary Gazette* for March 6th, 13th, 20th, 27th, and April 3d and 10th, from the Publishers.

The *Quarterly Journal of the Chemical Society*, for April, from the Chemical Society.

Specimens of Socotrine and Hepatic Aloes, the latter containing crystals of aloine, from Messrs. Horner.

Two specimens of Essential Oil of Elder Flowers, from Mr. George Whipple.

Specimen of Sea-weed having a natural incrustation of mannite, from Mr. R. Reynolds.

PILULA FERRI COMPOSITA.

MR. DAVENPORT made some observations on the preparation of this pill, the formula for which as given in the Pharmacopœia is as follows :—

“ Take of Myrrh, powdered, 5j.
 Carbonate of Soda,
 Sulphate of Iron,
 Treacle, each 3j.

“ Rub the myrrh with the carbonate in a vessel previously warmed ; then the sulphate being added, rub them again ; afterwards beat the whole together to form a mass.”

It was, he said, evidently the intention of the College that this pill should contain the proto-carbonate of iron with sulphate of soda and myrrh, yet when prepared strictly according to the instructions given, the proto-carbonate of iron first formed soon passed into the state of peroxide of iron.

With the view of obviating this objection, it was recommended by some commentators on the Pharmacopœia that the solid ingredients should be kept mixed in the form of a dry powder, to be made into a mass when required ; but any one conversant with the nature of the decomposition which takes place on adding a liquid to the mixed salts, must be aware that carbonic acid continues to be disengaged for some time after the mixture has been made, and this would cause the pills to swell out to three or four times their original size.

Others had recommended the substitution of the products of the decomposition which takes place, for the salts which give rise to such decomposition, but proposed the use of peroxide of iron, as the ultimate product of the change which the proto-carbonate usually undergoes. Peroxide of iron, however, being much less active than proto-carbonate, he considered this mode of preparing the pills objectionable.

Assuming that it was the object of the College that the iron should be administered in this pill in the state of proto-carbonate, and taking advantage of the permission now given by the College to deviate from the process described, when the end contemplated can be otherwise as well or better attained, he proposed that this pill should be prepared in the following manner :—

Decompose the carbonate of soda and sulphate of iron ordered in the formula in the way usually adopted for the preparation of proto-carbonate of iron ; collect the precipitate on a linen filter and separate the liquor as far as possible by expression. Add to the pressed mass a quantity of refined sugar equivalent

to the treacle ordered, and evaporate the mixture to dryness over a water-bath. Then evaporate the liquor containing the sulphate of soda to dryness, and add it to the preceding powder, together with the myrrh ordered in the formula. This mixture, in which the iron is in the state of proto-carbonate, will keep unchanged in a bottle excluded from light, and it may be readily made into pills, by the addition of a little water, when required for dispensing.

A similar result may also be attained more easily by using good commercial saccharated carbonate of iron (*Ferri Carbonas cum saccharo*, of the Pharmacopœia) in the place of that formed in the first part of the foregoing process. The following proportions, although not fractionally correct, correspond very nearly with those of the Pharmacopœia formula:—

Take of	Saccharated Carbonate of Iron (P. L.)	℥v.
	Dried Sulphate of Soda,	℥ij.
	Refined Sugar,	℥j.
	Powdered Myrrh,	℥viij. Mix.

ANALYSIS OF A SALINE ASH FROM BRITISH GUIANA.

BY MR. EDMUND GREAVES.

AMONG the interesting specimens exhibited at the late Great Exhibition from British Guiana, and presented to the Pharmaceutical Society, was one labelled Saline Ash, which is said to be used by the Indians as a substitute for salt.

It having been stated at a former Meeting that it would be interesting to know the composition of this substance, I have submitted it to an examination, the result of which I now lay before the Society. The ash in the state in which we have it is in black pulverulent masses. It is said to have been obtained by burning certain plants growing on the rocks near the rapids, about a thousand miles up the river Demerary.

The salt is very easily extracted from the ash by treating it with cold water, and evaporating the solution to dryness. Seventy-five per cent. of soluble saline matter may be thus extracted, the insoluble residue consisting of carbon, silicious matter, carbonate of lime, and insoluble phosphates in the following proportions:—

Carbonaceous matter	31.
Silicious matter	44.2
Carbonate of lime and insoluble phosphates	24.8

100.0

The salts soluble in water were found to consist of chlorides of potassium and sodium, together with a portion of alkaline carbonate and a small quantity of sulphate. It was tested for iodine, but there was none found. 100 grains of the dry salt gave

Sulphuric acid	1.0 grs.
Carbonic acid	4.4
Chlorine.....	45.648

Now, assuming the sulphuric and carbonic acids to be in combination with potash, we should have 84 grains of the chlorides of potassium and sodium, and as these contain 45.648 grains of chlorine, we may deduce the following composition of the salt by calculation:—

Sulphate of potash	2.18
Carbonate of potash	13.82
Chloride of potassium	33.6
Chloride of sodium	50.4

100.00

From the above results, it will be perceived that the peculiarity of this vegetable ash consists in the large amount of chlorides contained in it, which very well adapts it for the purpose to which it is applied, and renders it a tolerably good substitute for that essential substance common salt.

ON THE MODE OF ASCERTAINING THE PURITY OF ESSENTIAL OIL OF BITTER ALMONDS.

Mr. REDWOOD laid before the Meeting some samples of *oil of bitter almonds* prepared by different makers, together with the results of experiments he had made with the view of ascertaining whether or not they had been subjected to adulteration.

He stated, that his attention had been directed to the subject by more than one of the dealers in this article, in consequence of its having been represented that some of the samples had been adulterated with alcohol, an inference which had been drawn from the fact that the suspected samples had a much lower specific gravity than others met with in commerce.

He had been furnished with five samples from different makers, the specific gravities of which were as follows:—

1.	1052.4	4.	1081.
2.	1065.2	5.	1082.2
3.	1067.		

The merchants having no better mode of testing the quality of this oil than by its flavour, its specific gravity, and other physical characters, it was important to ascertain what reliance could be placed on this class of observations. It was well known that spirit was sometimes mixed with it, the effect of which would be to reduce its specific gravity, and this addition, to the extent to which it would be likely to be made, would not impair the flavour of the oil, or alter its sensible characters in any other way than as above stated. The light oils were, therefore, very naturally suspected to have been reduced with alcohol.

The experiments he had made in reference to this subject had fully satisfied him that the specific gravity of essential oil of bitter almonds, within certain limits, could not be relied on as affording evidence of purity or adulteration. The specimens on the table, to which he had already referred, although differing in specific gravity to the extent of nearly thirty grains in the thousand grain-measures, he believed to be all free from adulteration.

Before describing the tests which he had found to afford the most satisfactory indications, he described the proximate constituents of the crude oil, which vary considerably in proportion in different samples, and hence the differences in density and in some of the properties of the oil.

According to Liebig and Gregory, crude oil of bitter almonds consists of *hyduret of benzoyle*, *hydrocyanic acid*, *benzoic acid*, and *benzoin*, and these probably are not its only constituents. Of these the two first may be said to be essential constituents, and the others accidental, being the result of changes which the hyduret of benzoyle, or true oil of bitter almonds, undergoes.

The *hyduret of benzoyle* has the ordinary characters of an essential oil. When pure it is a colourless, transparent liquid, the specific gravity of which is 1043. It possesses the peculiar almond flavour, and is not poisonous. This, which is the true oil of bitter almonds, ought to constitute about eighty-five or ninety per cent. of the crude oil. When oil of vitriol is added to pure hyduret of benzoyle the mixture acquires a dark reddish-brown colour, but no other visible change takes place.

If the hyduret of benzoyle be exposed to the air it speedily becomes oxidized, and by the substitution of an atom of oxygen for one of hydrogen it is converted into benzoic acid. The *benzoic acid* present in oil of bitter almonds is the result of this transformation, and sometimes it occurs to such an extent that it is deposited from the oil in crystals. Benzoic acid is not coloured by the action of oil of vitriol.

Benzoin is also a product of a remarkable change which hyduret of benzoyle, when mixed with hydrocyanic acid, is liable to undergo. Like benzoic acid it is a solid crystalline body, but unlike benzoic acid, when mixed with oil of vitriol, it forms a violet coloured compound.

The characters and properties of *hydrocyanic acid* are too well known to

require notice. It is this constituent, which is sometimes present to the extent of eight or ten per cent., that gives to oil of bitter almonds its poisonous properties.

In examining oil of bitter almonds, with the view of determining whether it be pure or not, it is necessary to consider the influence on the action of the reagents employed, of variations in the number and proportions of the several constituents present. This is especially the case with reference to the use of oil of vitriol as a test.

On adding oil of vitriol to the samples of oil under notice, it was found that it formed with all of them a clear but very dark coloured mixture, from which no separation took place. The colour of the mixture thus produced, however, differed to a greater or less extent in each case. The lightest of the oils produced a reddish-brown colour, similar to that afforded by pure hyduret of benzoyle, while the heaviest oil formed a bright red mixture, having a shade of violet, and those of intermediate density gave intermediate shades of colour.

These results, viewed in connection with the differences of density in the different specimens, were at first thought to indicate that the light specimens had some admixture foreign to the oil, but on examining the action of the test on pure hyduret of benzoyle and the other legitimate constituents of the crude oil, it was evident that such an inference could not be justly drawn, and, indeed, suspicion now seemed rather to attach to the heavy oil. Subsequent experiments, however, showed that the light oil distils at a lower temperature than the heavy, and that if the heaviest specimens were distilled with water, the first portions that passed over produced precisely the same reaction as the light specimens above referred to, while the last portions that passed over, and especially the oil obtained from the water by distilling it after saturating it with common salt, produced with oil of vitriol a splendid crimson colour, the purity and intensity of which could hardly be surpassed.

It thus became pretty evident that the differences in the reaction of oil of vitriol with the different specimens of oil under notice, arose from variations in the circumstances under which the oils were distilled, and it seemed probable that the heavy oil had been obtained by distilling the almond cake with water, to which a large quantity of salt had been added, so as to raise the point of ebullition, while the light oil either was the product of a process in which less salt had been added to the water, or consisted of the first portions distilled.

In order to obtain more satisfactory evidence of the absence of spirit, or other foreign substance, from these samples of oil, nitric acid was used as a test. If oil of bitter almonds be mixed with about twice its volume of nitric acid, of specific gravity 1.420, no immediate action occurs. The greater part of the oil floats over the surface of the acid, and, if the former be free from adulteration, no change of colour takes place within several hours in either; but after the lapse of three or four days crystals of benzoic acid will begin to be formed from the oxidation of the hyduret of benzoyle by the nitric acid, and these will increase in quantity until the whole becomes a solid mass of crystals, which will gradually assume a bright emerald green colour. This reaction is very characteristic. If spirit be present in the oil to the extent of eight or ten per cent., the acid, after a few minutes, will begin to react upon this, and a violent effervescence will shortly ensue, accompanied by the disengagement of nitrous vapours.

By using strong nitric acid, of specific gravity not less than 1.5, the presence of a very minute quantity of spirit may be detected. The pure oil, when mixed with an equal volume of this strong acid, forms a clear and uniform mixture, from which nothing separates, and which undergoes but a very slight change of colour and no other visible alteration. The presence of two or three per cent. of spirit, however, is sufficient to cause a violent reaction and the disengagement of nitrous vapours.

After trying several other reagents, the foregoing were those which were found to afford the most satisfactory results, and appeared to be conclusive with regard to those adulterations likely to be practised.

LIVERPOOL CHEMISTS' ASSOCIATION.

Pharmaceutical Meeting, 20th February, 1852.

MR. SHAW, PRESIDENT, IN THE CHAIR.

MR. WALDIE delivered a lecture on the History and General Principles of Organic Chemistry. He commenced by defining the nature and objects of organic chemistry, and then proceeded to notice the existence of many proximate organic compounds discoverable by their physical properties, and their application to economical purposes, from the earliest times, in processes sometimes eliminating them in a greater or less degree of purity. He then took notice of the small number of such substances discovered by the early Chemists from the eighth to the eighteenth centuries, and drew attention to the very meagre amount of knowledge of the subject a century ago.

He next spoke of the dawn of organic chemistry in the discoveries of Scheele, by the isolation of many natural organic acids; the artificial formation of oxalic acid; and the discovery of prussic acid, from 1770 to 1783; and of the first ideas of organic analysis suggested by Lavoisier. And he then traced its progress in the discovery of the first eliminated alkaloids from 1803 to 1820; of cyanogen in 1815; the invention of the process for organic analysis by Gay Lussac and Thénard, and by Prout; the important researches of Chevreul on the fatty acids, published in 1823; the improvement in analysis by Berzelius, Liebig, Dumas, &c., and the subsequent rapid progress of this branch of chemical science in the various researches on indigo, uric acid, benzoyle, ethyle, and the host of other investigations to which these gave rise up to the present time.

The elementary constituents of organic compounds were now enumerated, and their arrangement into proximate principles; the different classes of these pointed out, and their characteristics; the nature of ultimate analysis was explained, and the doctrines of compound radicals, substitutions and isomerism, brought forward and illustrated. Decompositions and metamorphoses were then explained in their varieties of fermentation, destructive distillation, action of bases and acids, and oxidation, indirect and direct. And the lecture was concluded by a reference to the object of the science—to bring all the constituents of organic beings into definite compounds, and to its practical application in the formation of these compounds by art.

MR. ABRAHAM exhibited blood under the microscope, and brought under the notice of the Meeting the Pharmaceutical Bill now before Parliament, the provisions of which obtained general approbation.

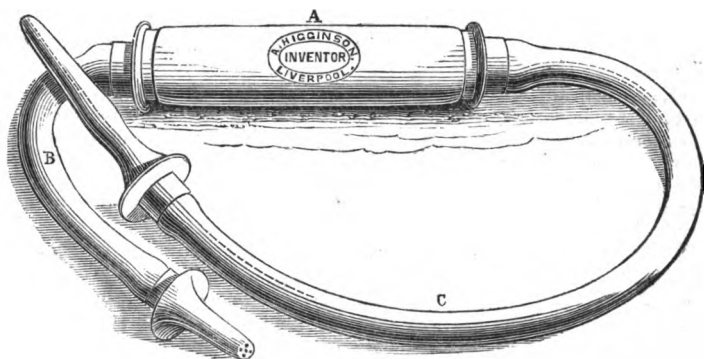
At a Meeting on the 5th of March, 1852, MR. WALDIE continued the subject of Organic Chemistry.

He commenced the lecture by a general view of the four principal elementary constituents of organic compounds:—Oxygen, Hydrogen, Nitrogen, and Carbon, pointing out their principal properties, characteristics, and places. He then glanced at a few of the properties of water in its relation to organic chemistry, and then proceeded to the consideration of the alkali ammonia.

The preparation and properties of ammonia were then described and illustrated by experiment. Its theoretical constitution was adverted to, and the analogy of the composition of its salts to metallic salts explained, as salt of ammonium. Some of the most important of its salts containing inorganic acids or radicals were then described. Amidogen and the amides were next brought under notice, and illustrated by reference to the chloramide of mercury, or white precipitate of the Pharmacopœias. The remarkable compound of ammonia with anhydrous sulphuric acid was described, and the platinum amides, or compounds containing platinum as a constituent, analogous in their properties to ammonia and the vegetable alkaloids, suggestive of consideration respecting the constitution of these, and illustrative of the doctrine of substitutions.

MR. MERCER exhibited various medicinal herbs cultivated and prepared for sale by the Shakers at New Lebanon, in the United States. He stated, that although they had been in this country about seven years, they were in perfect preservation. He showed a tube advertised as a "Bronchitis Tube," which, he said, appeared to be an ivory tube charged with camphor. He also exhibited one of the enema syringes,

invented by Mr. Higginson, of Liverpool, Surgeon, the construction of which will be better understood from the annexed sketch.



- A. The syringe barrel made of Vulcanized Indian rubber, with a valve at each end.
 B. Vulcanized tube, with metallic basin pipe.
 C. Vulcanized conducting tube with metallic terminal.

For use, the shorter end is immersed in the liquid to be injected, and then by alternately grasping and relaxing the barrel with one hand, holding the conducting-pipe in the other, an enema may be administered to the required extent. With an additional tube placed over the body-pipe, it becomes a most useful syringe for uterine injections.

ORIGINAL AND EXTRACTED ARTICLES.

EXAMINATION OF PAVON'S COLLECTION OF PERUVIAN BARKS CONTAINED IN THE BRITISH MUSEUM.

BY JOHN ELIOT HOWARD, ESQ.

It is not necessary for me to dwell upon the importance of this collection, both as regards pharmaceutical and botanical science. As the largest *original* collection of Cinchona Barks in England, it merits greater attention than has been hitherto bestowed upon it, and as presenting the results of the labours of those distinguished Spanish botanists by whom the greater part of the present species were named, it affords the opportunity of identifying these with the barks now found in commerce. I refer to the botanical expedition to Peru, which took place in 1777; and lasted eleven years. Messrs. Ruiz and Pavon were appointed to this expedition as botanists; and they were ably seconded in their researches by M. Dombey, a French physician and naturalist of rare merit. When the members of the expedition quitted America, M. Tafalla was intrusted by them with the continuance of their botanical labours and researches†. The published fruits of the Expedition are found in the admirable *Flora Peruviana*, also in the *Quinologia* of Ruiz, and its Supplement, and in the notices of the subsequent labours of Tafalla.

Mr. Lambert received an extensive herbarium, containing nearly the whole of the plants collected by the celebrated authors of the *Flora Peruviana* and their pupils, with "*numerous specimens both in flower and fruit, of all the species of the highly interesting genus Cinchona,*" collected by the above-mentioned botanists. He received also part of a collection which was taken in a Spanish prize bound from Lima to Cadiz, part of the cargo of which was sold in London, among

† Lambert's Illustration of the Genus Cinchona, 1821.

which was a fine collection of cinchona, purchased by the late Dr. A. Thomson, who gave him duplicates. Mr. Lambert also received from Pavon *fine samples of forty-four sorts of Peruvian barks, with their names.*

These barks and woods, with a large portion of the botanical specimens, were purchased, after the death of Mr. Lambert by the trustees of the British Museum, and are now deposited in the botanical department. They remain in the original packages, and with the labels and descriptions in the writing of the collector, M. Pavon. An important feature in the collection, in connection with the identification of the barks, is presented by thirty-six specimens of the wood of thick branches, with the bark adhering. These are numbered on the wood, and the numbers can still be made out with care; the descriptions are very legible. In referring to the barks, I shall follow the numbers attached to the species in Lambert's list†, and when I have occasion to mention the woods, it will be according to the numbers found upon these by Dr. Pereira and myself, in an examination of them which we have recently made together. I consider it of the greatest importance to have the assistance of this distinguished physician and pharmacologist, in jointly and attentively deciphering the indications afforded by these valuable materials for comparison. It requires much exercised powers of discrimination to distinguish the different kinds of bark in the varied appearances which the circumstances under which they have grown cause them to assume. Drought and moisture, shade and sunshine‡, so modify the coating, especially of barks, that it would be almost impossible for a person unaccustomed to them, to suppose the origin of such different appearances to be found in one tree. This Dr. Weddell remarked a few weeks since, as regards the *opposite ends* of one long quill of *C. micrantha* in my possession. Still, there are permanent and characteristic marks of distinction, as all who are interested in these products know. It is not, however, sufficiently understood, how important the botanical discrimination of the cinchona is, as I expect will be apparent in the course of this examination, for it has happened in many cases, and to a great extent, that the collectors have substituted the more easily gathered product of one tree of inferior quality for the bark of a cinchona, rich in alkaloids, without the dealers in the article here being at all aware of the fraud. In order to assist our opportunities of comparison, I prepared a number of easily portable specimens, which Dr. Pereira and I have placed in juxtaposition with those of M. Pavon, and thus were enabled to discriminate more perfectly the barks, almost bewildering otherwise in their unclassified state. M. Guibourt has examined the collection, and has made observations on them, which are partly contained in the 4th edition of his *Hist. des Drogues*, and partly inserted in loose pieces of paper inserted in the boxes containing the barks. It would appear from M. Guibourt's annotations, that numbers were formerly attached to the barks, such is not now the case. Dr. Weddell and M. Batka have also made some observations on the specimens. Other and very valuable standards of comparison are afforded by the collections of barks formerly belonging to Dr. Pereira, and now in the possession of the Pharmaceutical Society, viz., (A) that made under the superintendence of H. von Bergen; (B) those of Dr. Julius Martiny; (C) those sent by M. Guibourt; (D) barks collected by M. Pelletier; (E) bark from M. Marchand; (F) found by Dr. Pereira in English commerce; (G) specimens of barks collected by Poeppig in S. America.

I have also minutely examined the collection of Martius in the new museum of the College of Physicians, at Edinburgh, and have had the great advantage of the identification of those which I have myself collected in English commerce, chiefly by the distinguished naturalist Dr. Weddell, to whom we owe so much

† Page 17, Illustration, &c. The following numbers with asterisks are attached by Dr. P. and myself.

‡ The cinchona trees vary in the shape and smoothness of the leaves, according to the altitude at which they grow, to the severity or mildness of the climate, to the trees standing singly, or being closely surrounded by other plants, to the luxuriance of growth, and greater or less humidity of the soil.—Humboldt in Lambert's *Ill.*, p. 37.

in the illustration of this most important genus, and the discovery of the botanical origin of the richest Bolivian species; to M. Guibourt also I am indebted for several valuable hints, as also to Professor Theodore Martius, M. Batka of Prague, &c.

In order to present my observations in an intelligible form, I intend to arrange them under the heads of the different species, as enumerated by Dr. Weddell in his *Histoire Naturelle des Quinquinas*. Omitting then his No. 1, *Cinchona Calisaya*, which has no representative in the collection of Pavon, I commence with

No. 2. *Cinchona Condaminea*.

The botanical specimens of this are numerous, Dr. Lindley reports having examined six specimens in Lambert's herbarium, and fifteen in that of Dr. Thomson, many of them very fine ones†. Dr. L. says generally, "for my own part I have botanically followed Ruiz and Pavon step by step with their own specimens, and many others before me, and I am bound to say that, in my opinion, they are entitled to the greatest confidence for care and accuracy‡." We may be pretty well assured therefore at the outset, that this tree could not have escaped their notice, since it constituted, as determined subsequently by Humboldt, the most important and most valued Loxa bark§. Humboldt says|| his plant is "very positively the same as that which was represented by La Condamine," that he has "compared his specimens taken at Loxa with those sent from Peru by M. Joseph de Jussieu, and with those of M. de la Condamine. They all belong to the same species, and are remarkable for the small pit or hollow (*enfoncement*) which is observed in the leaves, in the axils of each principal nerve. It is on this hollow, which was not observed by La Condamine, that we establish the specific character of this first species."

M. Humboldt says further¶, "whoever determines single specimens of dried collections, and has no opportunity to examine or observe them in their native forests, will be led to discover different species by leaves which are of one and the same branch. Even the laurel-leaved *C. Condaminea*, the finest bark from Uritusings, has very diversified leaves, according to the altitude at which it grows, and which equals that of St. Gothard, or Mount Etna. It would deceive the bark-peelers themselves, if they did not know the tree by the glands, left so long unobserved by botanists."

One thing then is evident, and it is the important feature in the commercial point of view, that this celebrated naturalist described and figured the tree which produces the *finest old Loxa bark* as the *C. Condaminea*. M. Guibourt, however, says the *C. Condaminea* of Humboldt differs, in some respects, from the *cinchona* described and figured by La Condamine, and approaches more nearly to the *C. lancifolia*, of which a distinct species is made. Dr. Weddell unites under this head five varieties: α, vera; β, Candolii; γ, lucumæfolia; δ, lancifolia; ε, Pitayensis; and says, doubtfully, "not having seen any of the varieties of the *C. Condaminea* in a living state, it is not without hesitation that I have adopted the distribution which I have just presented‡‡". He says further, "it would above all be desirable to compare well together the bark of these trees on individuals of the same age. It is in my opinion the most infallible touchstone to pronounce on the affinities of species of this genus."

Now, in comparing the barks of Ruiz and Pavon, we find several varieties, distinguished by these botanists by different names, which seem to represent

† I am indebted to the Museum d'Histoire Naturelle for the following specimen: of a vera, one of Bonpland's collection, and one of M. Rivero's; of lancifolia, one of the specimens given by Mutis to Humboldt; of Candolii, one specimen of the collection of Pavon, given by Rivero; lucumæfolia, one specimen given by M. Rivero from Pavon's collection.

‡ M. la Condamine described the first sort known, that which is most esteemed in commerce, and which is generally known in commerce under the name of cascavilla fina, pl. eq. i., 36.

§ Lindley's *Fl. Med.*, p. 409.

|| Pl. Eq., vol. i., p. 86.

¶ On the *Cinchona Forest of South America*, by A. Von Humboldt, in Lambert's *III.*, p. 86.

‡‡ Page 89, *Histoire*, &c.

the one *C. Condaminea* of Humboldt. Weddell gives three of their names under the first head *α, vera*; and amongst these the *Uritusinga* (parrot's beak), so called from a mountain in the vicinity of Loxa, where the choicest bark for the royal pharmacy of Spain continued to be gathered in the time of Laubert† which certainly designates the finest and the original Loxa, or crown bark. M. Laubert shows, however, that varieties of this most precious Loxa were known and used in the royal pharmacy. There was at least the *amarilla* and the *roxa*, the yellow and red, proceeding from varieties of the same tree. The red variety (perhaps from the elevation of its place of growth) is described as only "about three yards" in height.

Both these varieties are represented in the collection, and belong, as far as we could judge, to the general head, *C. Condaminea*. Guibourt and others concur in this affiliation.

On the *botanical* part of the question it is not my intention to remark. The *C. Condaminea* might either be restricted or extended, so as to include all the varieties of *C. lancifolia*, growing in New Granada, as well as those of Peru; but the commercially important feature is this, that these barks belong altogether to the better description of barks, if we are to judge by the quantity of the different alkaloids which they contain, and have, therefore, come into use pretty freely in the manufacture of quinine and cinchonine, owing to the high price of the very superior barks of Bolivia. They possess moreover certain physical characteristics common to the whole range of this most extensive and most varied species.

Of all the varieties the original *C. Condaminea* is probably the richest in alkaloids; but as the tree was so wastefully cut in Peru that, according to Humboldt, 25,000 trees were destroyed (before 1779) in one year, it has apparently become scarce. Still, I think, it sometimes comes into commerce. M. La Condamine says, "in 1640, the Count and Countess of Chinchon having returned to Spain, their physician, the Dr. Juan de Vega, who had followed them, and had brought back a quantity of quinquina, sold it at Seville at 100 reals the pound. It continued to have the same sale and the same reputation until the trees of quinquina not barked having become scarce, the inhabitants of Loxa, in their thirst for gain, and having no means of supplying the quantities which Europe demanded, mixed different barks in the quantities exported to the fairs of Panama, in the time of the galleons, which having been found out, the bark of Loxa came into such discredit that people would not give one piastre the pound, whilst formerly four and six piastres had been given at Panama, and twelve at Seville. In 1690 a very large quantity remained at Piura and on the quay at Payta, which is the nearest port to Loxa, without any one being willing to export it; which circumstance commenced the ruin of Loxa, this place having become as poor as it was opulent in the period of its flourishing commerce. Amongst the barks which are often mixed with that of the quinquina, one of the chief is that of

† Laubert was chief physician to the Spanish army, and wrote a memoir on the different species of quinquina, translated and published by Lambert. He says (Lambert's *Ill.*, p. 62), "the quinquina de Loxa used in the royal pharmacy was procured latterly from the mountains of Uritusinga, Guatizinga, and Caxamuna; practitioners having found by experience that it is preferable to that gathered at Quito, Jaen de Bracamoros, Cuenca, and other places. D. V. Olmedo*, a distinguished botanist, was appointed by the King to superintend the collection and desiccation of this precious bark. This quinquina, *Cascarilla amarilla*, known also in Peru by the name of *Cascarilla de Loxa*, is the genuine cinchona of Ruiz. The tree to which it belongs grows in the provinces of Loxa, Cuenca, Jaen de Bracamoros, and others. This bark is slender, about the size of a goose-quill, pretty well rolled, and covered with a slight thin epidermis of a fallow grey. Its internal surface has the fineness and aspect of Ceylon Cinnamon, its fracture is very clear, except on the inner side, which presents little fibrous filaments extremely fine; its smell, which is considerably aromatic, becomes perceptible on pulverization or decoction; its bitterness is successively developed by a prolonged mastication, but it is always very inferior to that of the calisaya, it is also styptic; but without acerbity."

* To this gentleman Humboldt refers as having given him information under the head *C. Condaminea*. *Pl. Eq.*

alizier, which has a more styptic taste, and a colour redder within and whiter without: but that which is most deceptive is a bark called *cucharilla*, from a tree common in the country, which has no resemblance to the quinquina, except in its bark. It is nevertheless discovered, and connoisseurs are not deceived. It is in all probability the bark which we call *chacril*."

I should be inclined to bring together, under the general head of *C. Condaminea*, Weddell, the following barks in the collection†:—

a. vera.

- | | | |
|-----------------------------|---|--|
| <i>The Yellow</i> | { | No. 32. Quina <i>amarilla</i> fina del Rey, de Loxa. |
| | | No. 44. Cinchona cascarilla <i>amarilla</i> del Rey, de Loxa. |
| | | No. 41. C. cascarilla <i>amarilla</i> , Uritusinga. |
| | | No. 31. Quina <i>colorada</i> del Rey, de Loxa. |
| <i>The Red</i> | { | No. 45.*Cinchona <i>colorada</i> de Huaranda, sp. nov. inedita, es buena, marked also on the wrapper, Quina <i>colorada</i> del Rey, de Loxa. (Cinchona succirubra of Pavon, MSS.) |
| | | No. 20. Cinchona <i>colorada</i> , de Jaen. |
| | | No. 39. C. cascarilla <i>colorada</i> de los Azques de Loxa. |
| | | No. 40. C. cascarilla <i>colorada</i> de Loxa. |
| | | No. 68.*Cinchona <i>colorada</i> de Jaen, es buena, sp. nov. inedita (Cinchona conglomerata, Pavon). |
| <i>The Grey-Brown</i> | { | No. 33. Cinchona cascarilla <i>chaharquera</i> †, de Loxa. |
| | | No. 46.*Quina <i>chaharquera</i> de Loxa. |
| | | No. 3. Cinchona cascarilla fina de Loxa. |
| | | No. 60.*Cinchona sp. nova de Jaen en Loxa, es buena corteza. |

β. Candolii.

- | | | |
|------------------------|---|---|
| <i>The Black</i> | { | No. 34. Cinchona quina <i>negra</i> de Loxa. 1°. Espece quina <i>negra</i> . 2°. Espece cinchona de Loxa. |
|------------------------|---|---|

γ. lucumæfolia.

- | | | |
|--------------------------|---|---|
| <i>The Silvery</i> | { | No. 10. Cascarilla con hojas de Lucuma. 2°. Esp. de Loxa. |
| | | No. 36. Cinchona quina con hojas de Zambo de Loxa. |
| | | No. 56.*Quina hoja de Zambo de Loxa. |

δ. lancifolia.

- | | | |
|-----------------------------------|---|---------------------------------|
| <i>The Fibrous Orange Red</i> ... | { | No. 37. Quina estoposa de Loxa. |
|-----------------------------------|---|---------------------------------|

If this review be correct, we have at once more than one quarter of Pavon's sixty-nine specimens arranged under the head of this one species of

† I had in part completed the following arrangement before I met with that of M. Joseph de Jussieu, which seems to place the matter in a clearer light. M. Jussieu followed the steps of La Condamine at Loxa in 1739. His description of the genus agrees with that of M. La Condamine, but he admits a larger number of species, which may be reduced under two principal heads, of which the others are only varieties. The first comprehends the *red*, the *yellow*, and the *knotty*, which all have very smooth leaves, purple flowers, almost without smell, and the bark bitter, more or less coloured. Of these three, the most esteemed is the *red*. It is that which, employed from the first, had produced such speedy effect, which had acquired for it a merited celebrity. It became at length so rare, that M. de Jussieu found only some trees in the environs of Loxa. They have been obliged to substitute the *yellow* or the *knotty*, which the Spaniards of Peru even prefer, because they regard them as less active and heating. In spite of this national preference, our author does not hesitate to decide for the *red*, the efficacy of which he proved in his own person, and which he regards as infinitely superior.—*Histoire de la Société Royale de Médecine*, 1782. [The fine red bark of commerce is rich in alkaloids.]

‡ *Charque* is the Indian term for *dried meat*, whence in Bolivia the term *charquesillo*, for the bark intermediate between the *tabla* (flat) and *canuto* (quill). The colour of the Bolivian charquesillo is similar to that of the *chaharquera*. I do not know whether the words are as similar in meaning as in sound. The term *knotty* (noueux), employed by Jussieu for, as I conclude, the *chaharquera*, may very well indicate the peculiar and characteristic warts, which, from a very small size, increase till they become great prominent rugosities, nearly an inch in length; intermediate, at times they resemble in shape a coffee-seed, with a deep longitudinal fissure running down the middle.

Weddell†. The general character is that of the varieties of the *Quinquina gris brun de Loxa* of Guibourt, of which specimens are in the Pharmaceutical Society's collection. This M. G. himself identifies with the "fine yellow Uritusinga" bark in the collection, having marked No. 32 above, on a paper inserted in the box, "*Quinquina gris brun de Loxa*," a very descriptive name for its general appearance, and, perhaps, still more applicable to the chaharquera sorts.

We should, on this supposition, have made out clearly, in accordance with all the best authorities, that the fine *Loxa* bark of M. Guibourt is derived from *C. Condaminea*; but if we conclude from this that it is the origin of the finest crown bark of English commerce, because "*Loxa*" and "*crown bark*" are used as convertible terms, we should commit a serious botanical error.

The history of "*Crown Bark*" is this. It received this name in consequence of its use by the royal family of Spain. In October, 1804, a Spanish galley returning from Peru was taken by our countrymen off Cadiz. Among the treasures found therein were many parcels of Cinchona bark, two sorts of which were distinguished from the others by their external appearance and mode of packing. Two of these chests were marked "*Para la real familia*" (for the royal family), and were lined so carefully with sheet iron, that the gross weight of the package doubled that of its contents‡. The bark presented a surprisingly fine appearance: it consisted of unmixed fine quills about thirteen inches in length, which were tied together by means of bass in bundles of about three inches diameter. This is described by Goebel as the produce of *C. Condaminea*, and as differing from the present crown bark.

Just such a parcel of "fine old *Loxa*" quills, turned up among old stores at the London Docks, and was sold in 1850. It had traditionally remained twenty-five or thirty years there, and the packages were all decaying with age, so that it might even have been part of the parcel above referred to. Of this I obtained a portion. The packages contained (a) quills of fine *Loxa* tied up in bundles as described above; (b) quills resembling the specimen of *Q. gris fibreux royal d'Espagne*; (c) large thick heavy quills of *Condaminea* bark. Of (a) and (c) I obtained good specimens, and have examined them in reference to the quantity of alkaloids contained, which I found to be per cent. for (a): Quinine .714, Quinidine .514, Cinchonine .04.

This was from the smaller quills, and under the disadvantage of age, &c. The larger and stouter quills (c) are richer in alkaloids, especially in cinchonine. I conclude, therefore, that the old original "*crown bark*," the fine *Loxa* of Uritusinga, was one which well merited its character, on account of the quantity of alkaloids contained, which (*taking the whole together*, for the bark is rich in cinchonine, and calisaya is not) equals the *sum total* of alkaloids in some specimens of good *Calisaya* bark.

Contrasted with this, the result of an examination of some very fine "*crown bark*," the best then in the market (in 1850), I found the produce of this to be per cent.: Quinidin, finely crystallized from ether, .57, Cinchonine .06.

I have again this year tried another sample of very beautiful "*H O*" bark, and obtained as per cent.: Quinidin, crystallized from ether, 1.05, Cinchonine .08.

The "*H O*" and a crown were brands adopted in the time of the Spanish dominion for two different sorts of bark, which are both included now under the general title "*crown bark*."

This is in larger quills, and the large quills must always be expected to contain more alkaloid than those which consist almost entirely of outer coat§. So

† Humboldt describes only four cinchonæ, two of which are now removed from this genus. The authors of the *Flora Peruviana* depict thirteen, of which eight are still recognized as cinchonæ.

‡ Goebel, *Pfl. Waer.*, i., p. 35.

§ La Condamine says, "They told me at *Loxa*, that *anciently* they preferred the *largest barks* (*les plus grosses ecorces*) which were put aside with care as the most precious, *now*, the smallest are preferred. One may suppose that the dealers find their advantage in this, because the fine quills go in a smaller compass. But a director of the English South Sea Company at Panama,

that we have not only the substitution of barks poorer in alkaloids for the old Loxa richer in alkaloids, but we have β quinine or quinidin substituted for quinine, if this be of any importance.

I find that this view is in part confirmed by Von Bergen, who says, under Pl. vi., "After all the trials, the results of which are comprehended in this table, were completed, there arrived, by way of *Cádiz*, a parcel of Loxa bark, which, without being particularly heavy, was particularly distinguished, as containing the unmixed precious article. It appeared to me very interesting, that the contents of this Loxa, for which 4 marks banco per lb. were willingly paid, should be ascertained, and compared with those kinds which recently are accustomed to be found in what comes by way of *London*, of a mixed Loxa of very different kind of bark, the price of which has fallen to 44 schillings banco. The result was, that the *Cádiz* bark contained in 100lbs., 34.583, but the common Loxa from *London* in 100lbs., only 30.862." (Of what alkaloid is not stated.) The contrast here is between *fine* *Cádiz* Loxa, and the *worst* *London*.

The history of the change from the old to the modern Loxa, is thus given by Goebel†. "There are, according to Humboldt, immeasurable forests of *Cinchona scrobiculata*. The bark is abundantly collected by the inhabitants, very highly prized, and sold under the name of *Cascavilla fina de Uritusinga*, and shipped at Payta. V. Humboldt says further, that in commerce it is only with difficulty that this bark can be distinguished from that of the *Cinchona Condaminea*." This statement, which Goebel gives on Humboldt's authority, but without reference to any work (it might have been information verbally given), is important in reference to the botanical origin of the present "H O bark." I do not know any authentic specimens of the quill‡ bark of *C. scrobiculata*,

by which place all the bark which goes to Europe necessarily passes, assured me that the preference now shown for the smallest quills, is founded on analyses of English Chemists of both barks, and it is probable that the difficulty of drying perfectly the large quills, and their consequently becoming damaged, has contributed to bring them into discredit. The common prejudice is, that in order to lose none of their virtue, the tree should be stripped in the waning of the moon, and on the east side of the tree, and they did not forget to make affirmation before a notary of these circumstances in 1785, as well as of its having been gathered on the mountain of Cayanuma, when the last Viceroy of Peru made a provision of bark to carry to Spain on his return. The interest of the collection, which forbids them to remain inactive three-quarters of the year, has caused most of those who gather the bark to give up their prejudice, such as my host at Cayanuma, who assured me that all the seasons of the year were equally proper, so long as the weather was dry."

† The table of *C. scrobiculata* contains a similar quantity of quinidine, but more cinchonine.

‡ Hayne thus describes the bark of *C. Condaminea* gathered by Humboldt and named *Quina de Loxa*, which were found in a collection of Humboldt's, which Kohlrausch received after Humboldt's return from America, as marked in Bonpland's handwriting. "They are pieces of the thickness of half a line to a line easily broken, in part rolled together, and in part rolled in upon themselves, from the one-sixth to one-third of an inch in diameter. The outer surface *wrinkled longitudinally* with a larger or smaller number of distant, scattered, short *cross cracks*, the edges of which are in a small degree *turned outwards*, covered with scattered elevations, having the appearance of *warts*, of an *unequal brown colour*, sometimes falling into a blackish and sometimes into a yellowish tint, covered with a fragmentary epidermis, sometimes stone grey, sometimes ash grey. The *inner surface* is particularly *evenly stripped*, of the colour of *rust, cinnamon brown*; the *fracture* similar in colour, *mostly even*, a little *splintery towards the inner surface*, the outer side showing under the thick epidermis a dark brown ring. The taste peculiarly astringent, a little sour, and only a little bitter."—Goebel, i., 86.

M. de la Condamine says (*Acad. Royale des Sciences*, 1738) "The best quinquina, at least the most celebrated, is gathered in the mountain of Cayanuma, situated two-and-a-half leagues south of Loxa, and it is from thence that the *first* which was brought to Europe was derived. It is not fifteen years since the dealers provided themselves with a certificate before a notary that the quinquina which they brought was from Cayanuma. I visited this mountain on the 8d of February last, 1787, and passed the night on the top, at the dwelling of a man who has made this his residence, to be nearer the cinchona trees, as the collection of the bark is his ordinary occupation and his only trade; on the way, on going and returning, I had the leisure to see and to examine many of these trees, and to sketch on the spot a drawing of a branch with leaves, flowers, and fruit, which are met with at the same time at all seasons of the year. I brought back the next day at Loxa many flowering branches, which enabled me to finish my drawing, and to colour it after nature, such as I append to this memoir. [This plate is copied in Woodville's *Botany*, iii., 546. It agrees well enough with the specimens of *C. Condaminea*.] They com-

but Goebel gives Haynes' description of the bark of *C. Condaminea*, as collected by Humboldt, which, as he shows, agrees with the *old*, but not with the *modern* Loxa, whilst, on the other hand, the bark of *C. scrobiculata*, of which Haynes gives the account in the same place, sufficiently points out the *present* H O bark. Goebel concludes, therefore, that in *La Condamine's* time, almost all the bark brought to Europe was that of *C. Condaminea*, but that the *present* Loxa of trade comes from the *C. scrobiculata*. He says further (p. 42) that the new bark being also sold under the old approved name of *C. fina de Uritusinga*, made the change more deceptive. He gives under the head *Cortex China fuscus*, some good directions for distinguishing the barks of these two species.

I cannot find in the collection of Pavon *any* bark resembling the "H O" (crown) "bark" of commerce.

I will now give my reasons for the arrangement of the several species under *C. Condaminea*.

Var. a. vera.

No. 32. *Quina amarilla fina del Rey, de Loxa.*

This bark in the Museum closely resembles the "finest old Loxa" bark of which I have given the particulars above, as found at the London Docks. It has, what is well called by Dr. Pereira, a *file-like* coat, and in this respect is entirely like the No. 29 *bis.* sample of M. Guibourt's *Q. gris brun* de Loxa. The cracks ramify in every direction. It is No. xx. on the wood, the coat *smoother*, marked "*Q. de Loxa jaune fibreux*," by M. Guibourt, and more of the character which is described as "like that of a cherry-tree." These two characters of coat seem to interchange, as the *colorada* on the wood is *smoother*, the bark separate is *rougher* than the *amarilla*; the black rough coat of the Uritusinga as adhering to the wood, is very remarkable.

The description of the red and yellow varieties by La Condamine would seem to indicate the *macho* and *hembra* varieties of the same tree. See Weddell's *Histoire*, p. 21. The botanical specimens in Pavon's Herbarium of the *roza* and *amarilla* are exceedingly similar; they both resemble Bonpland's *Condaminea* so nearly that I can only suppose them varieties.

The *amarilla* and *colorada* are thus referred to in Lambert:—"M. Pavon having had the politeness to show us the drawing of this shrub (the red), the two drawings (of the red and yellow) appeared to us so similar that we found only a slight difference in the colour of the flowers, and were unable to discern on what character their specific difference could be established†". The same may be said of the two kinds of bark. The *amarilla* is on the whole smoother than the *colorada*, the pieces are smaller, none more than half-an-inch in diameter, the substance brown red, deep cracks with markedly everted edges, and seldom forming rings. Some pieces lose the coat, and shew a maroon-

monly distinguish three species of quinquina, although some count four, the *white*, the *yellow*, and the *red*. They told me at Loxa that these species differed only by their efficacy: the *white* having almost none, and the *red* being better than the *yellow*; and that, for the rest, the trees of the three species did not differ essentially; but my guest at Cayamuna, who passes his life in this mountain in barking the trees, assured me, and this assurance was confirmed by the testimony of people of the best information, that the *yellow* and the *red* have NO REMARKABLE DIFFERENCE in the *flower*, in the *leaf*, in the *fruit*, nor even in the *bark externally*; that, finally, they cannot distinguish one from the other by the outside, and that it is only on running the knife into the bark that they distinguish the yellow by its less deep colour, and more tender consistence. The red and yellow grow side by side [This is said to be the case with the red and yellow varieties of *C. lancifolia* in New Granada], and the bark is collected indifferently, although the preference is for the red; the difference becomes still less on drying. Both barks are equally brown outside, and it is the mark which passes for the most sure of the goodness of the bark; they also require that it should be rough outside, with cracks (*brisures*), and brittle."

† Of which he gives these characteristics:—"The epidermis thin, but rather thicker than that of the yellow, wrinkled, of a chestnut brown, and covered with silvery flakes and very small lichens; *transversal fissures*, more numerous than the *amarilla*, and very distinct; thickness somewhat less than a line, roundness or rolling complete; fracture clear, with little filaments in the internal parts; thickness the same as the former, internal surface not so fine, and of a greyish-yellow; no perceptible difference from the former [see No. 32] in the other qualities."

coloured, smooth skinned derm; in others, as in the *colorada*, the coat itself is quite smooth, pale, but cracked; some pieces shew warts split down the middle, of brown yellow colour, lighter than the dark grey of the coating generally. (See Hayne's description of Humboldt's *Condaminea*). On the whole it is a bark of medium-sized quills, brown and heavy, not flexible.

No. 31. *Cinchona quina colorada del Rey, de Loxa*.—This is Pavon's name in Lambert's list. There are two samples in the museum.

No. 44. *Cinchona cascarilla amarilla del Rey, de Loxa*.—Not in the Museum, probably a duplicate in Lambert.

No. 41. *Cinchona cascarilla amarilla Uritusinga*.—Also in Lambert, but not in the Museum. The wood-bark is No. xxi., it is rougher than a rasp.

(a). No. 31.—Called *Cascarilla colorada del Rey, de Loxa*.—I cannot, on most careful examination, distinguish this from *C. Condaminea*, taking the *C. fina de Uritusinga* (so marked on the wood) as the standard of the species. It is more red than the *amarilla*. The cracks are deep, with everted edges, not generally forming rings (this is only noticeable on one piece) but ramifying in every direction; they are about one-eighth of an inch apart, and the whole interval filled up with grater-like protuberances; exactly resembling the (No. 29, Ph. Soc.) *Q. gris brun de Loxa* of Guibourt. The internal structure is rigid, hard, fibrous but slightly so, breaks with a few short fibres on the inner edge. The taste is now feebly bitter. The coat in some pieces becomes smooth in places and quite soft to the touch, covered with a pale yellowish epidermis, on which the impression of cross cracks is still visible.

The general colour is *grey brown*, the larger quills are not rolled together, but open; the bark is heavy, and according to Guibourt has no connection with his *quinquina rouge vrai verruqueux*.

(b). No. 45.—“*Quina colorada del Rey de Loxa*,” marked on this other side of the wrapper, “*cinchona colorada de Huaranda sp. nova inedita, es buena*.”

Guibourt says † this bark agrees with his “*quinquina rouge non verruqueux*,” which is identical with *casc. colorada de Huranda* in Delessert's collection, and which, in Delessert's list, is marked as the name of the species *Cinchona succirubra*, in Pavon's MSS. It is quite like commercial red bark, the coat is like that of *Condaminea*, but easily detached (some pieces are quite deprived of coat) and shewing various *crater-like* elevations and depressions, such as occur on red bark. The substance brown red, brick coloured: the transverse cracks are rather distant.

The *Cinchona succirubra* “red juice” (whatever its botanical origin) is, I think, commercial “red bark.”

The first of these two specimens must be the *red cascarilla* of Laubert, Lambert (p. 64 †) and his *cascarilla del Rey* (p. 77 †).

The second (b) seems equally to have borne the name *C. cascarilla colorada del Rey*, and to have been commercial red bark. Were the two then so nearly allied as to be confused together?

No. 20. *Cinchona cascarilla colorada de Jaen de Loxa*.—This is No. xxxiii. on the wood, which has a coat of bark like the *C. fina de Uritusinga*.

The specimen of bark is a grey bark with red substance. Dr. Pereira suggests that it is probably the “*Quinquina de Jaen, on de Loxa ligneux, rougeatre*,” Guibourt iii. 114, and calls it “grey externally, reddish internally: grey red bark, in quills, *file-like*,” characteristic of *C. fina de Uritusinga*.

No. 40. *C. Cascarilla colorada de Loxa*.—(See under No. 68*).

† “This bark occurs in large and small pieces, the latter were rolled, the others only half, both pretty fine; none are found exceeding a line in thickness. Its epidermis is also very fine, *tawny, greyish, and smooth*; external surface *ochrey inclining to red*; its fracture *clear*, with a few fibres towards the interior edges, its flavour styptic, and more disagreeable than bitter, with little or none of the aromatic odour peculiar to good *quinquinas*. This bark presents on the internal surface almost the appearance of genuine red *quinquina*, but externally it resembles the bark of the cherry-tree.”

‡ *Hist. des Drogues*, 4me ed., p. 124.

No. 39. [*Cinchona Cascarilla colorada de los Azques de Loxa*].—In Lambert but not in the collection. It is No. xxx. on the wood, and has a *Condaminea* looking coat.

No. 68.* *Cinchona colorada de Jaen, es buena, sp. nova inedita*.—Pereira, "File-like, reddish crown, straight quills, rigid fibre, *Condaminea* coat," &c. Guibourt calls it *Quinquina de Jaen ou de Loxa ligneux, rougeatre*. No. 20 of the barks of the museum, and No. xxxviii. of the wood marked *Cascarilla colorada de Loxa*, the bark *file-like*, as in the *Uritusinga*.

No. 33. *Cinchona Cascarilla chauerquera de Loxa*.—It is a smoother bark than the *C. amarilla del Rey*, *brown*, with warts split down the middle, maroon-coloured derm, where exposed, moderately fibrous, when cut shews a resinous ring, very bitter, some pieces are sliced from the tree in the same manner as grey bark. Like the broken part of the *Condaminea* found at the London Dock (b) and (c).

No. 46.* *Quina chaharquera de Loxa*.—This is included by Dr. Weddell under his head *C. Condaminea a vera*. It is No. ii. on the wood, the bark adhering to which resembles the other specimens of *Condaminea*, but the cracks run more intorings around the branch. It is marked in the collection "*Cinchona species nova de Loxa inedita vernaculé chaharquera*." Dr. Lindley says, † "It is remarkable that Ruiz and Pavon do not, in their published works, notice (the *C. Condaminea*) which nevertheless seems to be one of the most common. I presume, however, that it is the sort which Ruiz calls *C. chaharquera*, and which he says is not only one of the most valuable kinds, but to which the tradition attaches among the bark gatherers of Loxa, of having been the identical bark sent by the corregidor, Don Francisco Lopez Cañezares, in 1638, to the viceroy of Peru, the Conde de Chincon." The bark in the museum corresponds with (b) and (c) of the parcel found in the London Dock. Dr. Pereira remarks upon them as "moderately small quills, *crown*, with transverse but not very numerous cracks."

If the vernacular name means to express a resemblance to the colour of smoked or dried meat (as I conceive to be the case), it describes accurately enough the prevailing hue of this bark, which is, nevertheless, one rich in alkaloids, and deserving the character it has obtained.

I should refer to this head the bark deposited in the museum, under the name of *C. Condaminea a vera*, which is part of a parcel that came by way of Lima in 1850. Of this I sent a portion to Dr. Weddell, who recognized it as the bark of *C. Condaminea*.

It is difficult to describe this bark, as it varies so much; but its general character is rough, rugged, dense, much thicker on the large branches than most species, the coat sometimes corky, smooth, and covered with a silvery epidermis, sometimes like a rasp or file, and this character is especially to be remarked in the *canutillos* or small quills, which coincide in this character in the *C. Condaminea a vera*, *lucumæfolia*, *lancifolia*, and, perhaps, other varieties. The *pustular warts*, described by Hayne in Humboldt's *Condaminea*, assume in some pieces a very unique appearance. They occur also on some specimens of red bark.

No. 3. *Cinchona cascarilla fina de Loxa*. Guibourt No. ii., *Quinquina de Loxa brun compacte*. This is the *canutillo* or very young bark, cut from the tree in such a manner, that slices of the wood still remain inside the quill. It may very well be the bark of *C. Condaminea*, which it resembles; some of the smallest quills present the appearance of "silver crown," and consequently of Seeman's *Condaminea*†.

No. 60*. *Cinchona sp. nova de Jaen en Loxa, es buena corteza* (*Cortezon* means thick bark: Lambert, p. 71.)

This is an ordinary kind of grey bark, but not at all like that of *C. nitida*. It seems a rather fibrous variety of *Condaminea*, and has *Hypochnus rubroinctus* growing on it.

(To be continued).

† Lindley's *Flora Medica*, p. 415.

‡ *Flora Med.*, p. 415.

ON THE REMARKABLE OPTICAL PROPERTIES OF A NEW SALT OF QUININE—THE IODIDE OF DISULPHATE OF QUININE.

BY WILLIAM BIRD HERAPATH, M.D.,
University of London.

(Concluded from page 455).

(E.) The next phenomenon to be described will be the result of examining these new polarizing and depolarizing crystals by means of two tourmalines, a polarizing and an analyzing plate, as they are commonly called. This is in fact submitting them to the same experiment as most other crystalline bodies are subjected to when examined in the polarizing microscope.

In this arrangement it will be necessary to have two crystals crossed at right angles; and the whole object capable of being revolved horizontally on its own axis.

In the first place, let the crystals be supposed to be examined when the planes of the prisms correspond with the planes of the tourmalines. See fig. 11.

The field of the microscope will be dark, as the two tourmalines are at right angles.

The crystal *a* being at 90° to tourmaline *d*, of course increases the polarizing effect; the crystal *b* being at right angles to the tourmaline *c*, of course also polarizes and adds to the effect; and at the centre *e* we have the combined influence of the two tourmalines and the two crystals also; we consequently have the maximum polarizing effect which it is possible to produce with this combination.

In the second place, we will rotate the object, so that the planes of the two crystals shall be altered, the tourmalines remaining stationary (fig. 12.) If the rotation be managed so as to move the whole object through an arc of 45° , the crystals now become placed in the most favourable position for exhibiting the phenomena of depolarization; they compel the light to pass through and at the same time communicate colour to the beam.

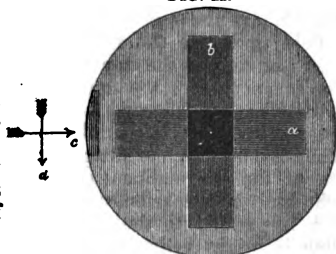
In fig 13 the same phenomena are shown to occur with the hexagonal crystals, four of these are at 45° to the planes of the tourmalines—they all depolarize the light. Four others coincide in their planes to those of the tourmalines, and they do not alter the colour of the field.

(F.) We will now proceed to the examination of these crystals by means of a single tourmaline and the selenite stage.

This arrangement consists in placing a tourmaline in the centre of the field of the microscope upon the stage, and then superimposing a thin plate of selenite of such a

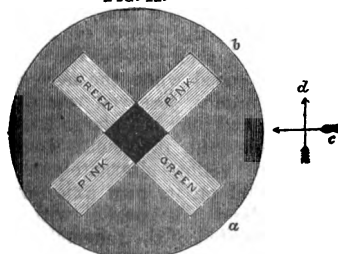
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FIG. 11.



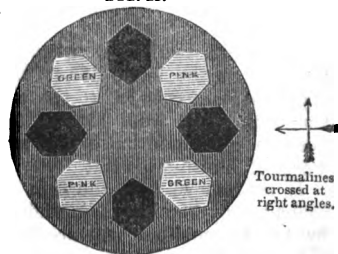
Two Crystals examined by two tourmalines, crossed at right angles.
[Planes of Crystals coincide with the planes of the tourmalines.]

FIG. 12.



Two Crystals, examined by two tourmalines, crossed at right angles.
[Planes of Crystals 45° to the planes of tourmaline.]

FIG. 13.



Eight Hexagonal Plates, examined by two tourmalines, as before.

thickness that it will give a brilliant blue or port wine colour when examined with another tourmaline placed over the eye-piece of the microscope.

But in the experiment now to be described, the superior plate of tourmaline is not employed.

In the opposite diagram (fig. 14) four prismatic crystals of the iodide of the disulphate of quinine, are supposed to be arranged at various angles of rotation; (*a b*) is placed in the position 0° — 180° , and at right angles to the plane of the tourmaline; (*c d*) is across the field at 90° to the former one, and of course parallel to the tourmaline. Under these circumstances the appearance is most remarkable, and different from that of any substance examined in a similar manner.

That crystal which is at right angles to the plate of the tourmaline (*a*), produces the bright blue of the selenite stage; the prism which is parallel to the plane of the tourmaline is bright yellow, the complimentary colour to the blue seen before.

Had we been examining the selenite stage with a tourmaline over the eye-piece, the whole field of view would have assumed the blue tint, when the superior tourmaline or analyzer was at right angles to the inferior tourmaline; upon rotating the analyzing plate of tourmaline through an arc of 90° , it follows that the planes of both tourmalines would then coincide, the whole field would then assume the complimentary yellow colour. The same effects were produced when the new crystals were only difference observed was simply one of extent; had they been large enough to cover the whole field, the colour would have been blue and yellow alternately as we rotated the crystal on its own axis, and according as its plane was parallel with, or at right angles to that of the tourmaline beneath the selenite stage.

The force of this argument becomes immediately most conclusive when we examine the hexagonal crystals; just so much of the stage as happens to be covered by the crystals examined, becomes blue or the complimentary tint; according to the position of the axis or plane of the crystal, the rest of the field is bright or clear, being white, light, and destitute of colour. Vary the form of the crystal, and the appearances also change.

There are two other prisms arranged in the diagram, fig. 14, one (*e-f*) placed from the angle 45° to the opposite point in the circle, viz., 225° ; this crystal is therefore 45° to the plane of the tourmaline. The other arranged across the field from 135° to 315° is also 45° to the tourmaline. In these positions we obtain but a very small amount of polarizing power—they produce a sort of bluish-olive tint.

If we remove from the field of the microscope the crystal of selenite and replace it by another of a different thickness, the one which when examined by two tourmalines, will produce a deep port-wine colour when the polarizers are crossed at right angles; and the complimentary bright green when their planes coincide; we have the phenomena depicted in fig. 16.

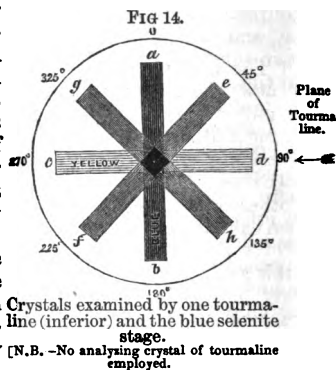
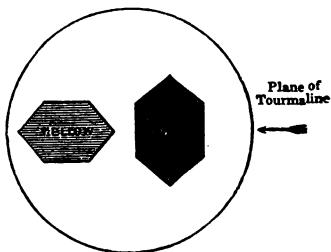


FIG. 15.



Two Hexagonal Crystals, examined as before, with the inferior tourmaline and the blue selenite stage. No analyzing crystal of tourmaline.

Crystal $a-b$, as before, at right angles to the tourmaline, colours the stage and the field (as far as its influence can extend) of a deep wine-colour; $c-d$, as before, parallel to the tourmaline, develops the bright green colour, and complimentary to the former. The two other crystals are of a deep olive-green tint, in consequence of two circumstances; at this angle the new crystals have a small amount of polarizing power, and their depolarizing property is at its maximum, consequently, the superior surface of the prismatic crystal acts as the analyzing plate to the inferior surface, which adds its influence as a depolarizing crystal to the thickness of the selenite stage, the colour is therefore a compound of the two thicknesses.

One circumstance has been overlooked in this description, viz., the centre of the field; here we have a beautiful star-like appearance, with a square black centre; of course, at this point, all the four crystals exert their polarizing powers, and the whole light becomes shut out.

The points of the stars are eight in number, and result from the influence exerted by the crystals $e f$ and $g h$ crossing at 45° those arranged at 90° , namely, $a b$ and $c d$.

Four of the points of triangular form are yellow, the other four are of a neutral tint. This description has been taken from the diagram of blue selenite, fig. 14; but it will apply to that of the red stage, if we replace the yellow points with green ones, and the neutral tinted ones with red; the central black square is the same in both instances.

These phenomena were so extraordinary that the author was induced to make a comparative series of experiments with other crystalline substances, as he felt convinced that the selenite stage would be a much more delicate test of the phenomenon of polarization, or rather of the power of polarizing light, possessed by any substance, than the usual method adopted in order to discover it; namely, by the tourmaline alone, as the eye can readily discriminate the slightest difference of colour or tint, whereas it would not so easily notice mere light and shade.

Before submitting disulphate of cinchonine* to this experiment, he found it to possess decided power of polarizing a ray of light.

This substance crystallizes as a tuft of minute radiating prisms, sometimes arranged in a perfect circle. Upon placing such a tuft upon the tourmaline covered by the selenite stage (No. 2, or red) one-half of the tuft appears green, the other half decidedly pink; but arranged in four segments of a circle—that from 315° to 45° is decidedly pink—that from 45° to 135° is green and greenish yellow—the segment comprised between 135° and 225° is pink—that between 225° and 315° is again green and greenish yellow. (Fig. 17.)

It, therefore, is evident that all those prisms which are at right angles to the plane of the tourmaline are pink; whilst all those parallel to the plane are green; the power exists also in an inferior degree on each side of these lines and extends over an arc of 45° on either side—making, of course, four segments of 90° of coloured light.

The same effect is also to be found when the blue

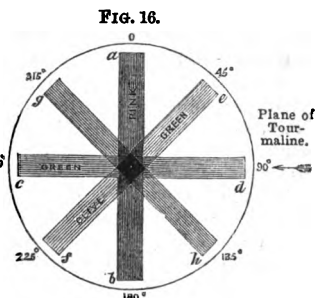


FIG. 16.
Crystals examined by one tourmaline and the red selenite stage.
[N.B.—No analyzing crystal of tourmaline employed.]

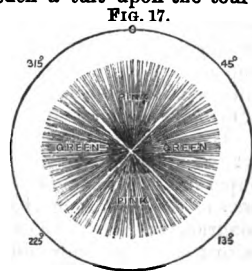


FIG. 17.
Disulphate of Quinidine (β Quinine) examined by the red selenite stage and one tourmaline below it, without any tourmaline as an analyzer.

* I have since found that I was in error in considering this a salt of cinchonine. It is disulphate of quinidine.

selenite stage is used; but it requires a better light and illumination to discover it—the colours are not so distinct—the segments are respectively blue and yellow alternately.

Upon submitting pure cinchonine in a crystalline state, as deposited from its alcoholic solution on cooling, the evidence of the same power exhibits itself. This substance forms rhomboidal prisms perfectly colourless under ordinary circumstances, but when thus examined the prisms show a decidedly blue and yellow tint, or pink and green, according to the stage employed.

The oxalurate of magnesia (discovered in the urine of a patient afflicted with the oxalic acid diathesis, after having had the solution of bicarbonate of magnesia administered to him for some time) possesses the same power to a considerable extent; this body crystallizes in dumb-bells, and these develop the colours with tolerable splendour.

There is no doubt that more time spent in the careful investigation of this phenomenon would considerably enlarge the catalogue of substances which possess the faculty of polarizing light, but none of those now enumerated possess it to the extent of the iodide of the disulphate of quinine.

To return from our digression to the point from which we started, our next mode of examining the properties of the new crystals, will be with two tourmalines and the selenite stage.

Taurine possesses this power in a slight degree only.

Some radiating crystals of carbonate of lime or magnesia formed between the tegumentary layers of the shrimp are also capable of polarizing or rather analyzing the ray to a slight degree.

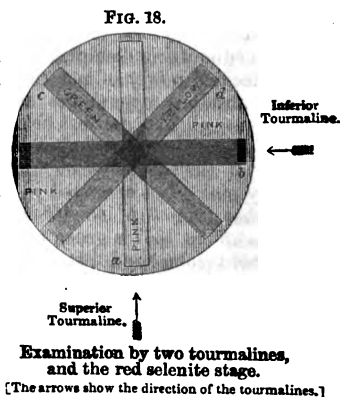
The nitrate of urea, the oxalate of urea, nitrate of potassa, and nitrate of soda (rhombic) possess this power in great splendour.

Recently, in consequence of having had a quantity of pure disulphate of quinine placed at my disposal, through the kindness of Messrs. Howard and Kent, the celebrated Pharmaceutical Chemists; the salts of this new alkaloid have been examined, and I have discovered that the disulphate, the neutral sulphate, the oxalate, the basic hydrochlorate, as well as the clino-rhombic prisms of the pure alkaloid (as deposited from the alcoholic solution) are eminently possessed of the power of analyzing a polarized beam of light. The optical properties of this substance fully establish the difference between this alkaloid and its well-known congeners quinine and cinchonine.

(G.) The opposite diagram (fig. 18) shows four crystals arranged at various angles as before, dividing the circle of 360° into eight separate portions. It will be understood that in this experiment the two tourmalines are arranged at right angles; the one being placed over the eye-piece, the other upon the stage of the microscope—the plate of selenite is superimposed on the inferior tourmaline—the field is wine-coloured, as the pink selenite stage has been employed.

The prism *a* is at right angles to the inferior tourmaline, and parallel with the superior, it consequently acts in the same way as the crystal in the same direction in diagram fig. 16. The prism *b*, being parallel with the inferior tourmaline is at right angles to the superior (the most favourable position for polarization), it consequently obstructs the whole of the light.

The crystals *c* and *d* are at 45° to either tourmaline, and, therefore, at that angle which is most favourable for showing the phenomena of depolarization; they are coloured green and yellow respectively, as they now add the influence of their own thickness to that of the selenite stage.



The centre of the combination shows the star-like form described before—in consequence of the crossing of the various crystals at different angles.

The experiment being varied by employing the blue selenite, all other points as before, we now of course find the field blue.

The prism *a* is now blue, and from the same cause which occasioned its red tint before.

The crystal *b* is dark as before.

The crystals *c* and *d* are violet and orange respectively, being complementary in colour the one to the other.

Upon revolving the superior tourmaline the whole appearance changes—the field passes to green in the first case and yellow with the second stage, the crystals progressively pass through various changes in colour and appearance, each in its turn becoming a polarizer in action with the superior tourmaline.

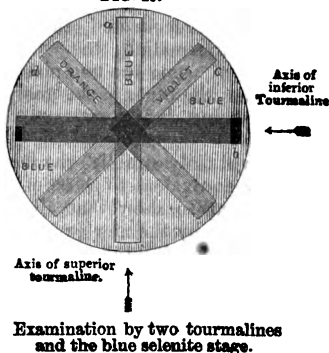
(H.) It has already been stated that the author has succeeded in adapting one of these "artificial tourmalines" to the stage of his microscope; it is sufficiently large to give a uniform tint to the whole of the field, and it covers a surface of the one-eighth of an inch in diameter; this will bear magnifying to any extent, and he has been enabled to illuminate a field of eleven inches in diameter with light polarized by its means. Of course it is at once evident that such a crystalline plate would be far too small to be serviceable as the analyzing plate above the eye-piece. A crystal of at least half-an-inch in diameter would be necessary for this purpose.

But there is often found a crystal sufficiently large to be so employed, were it possible to transfer it safely from its mother-liquid to a plate of glass, in order to mount it; the difficulty consists in the extreme fragility of these microscopically thin compound plates; the slightest touch is sufficient to disrupt them—the slightest movement in the liquid will at times destroy the connection existing between the edges of the component prisms, they will of course then lose their uniform and parallel arrangement; wherever they cross, polarization and obstruction of the rays of light necessarily occur, and the plate is of course useless for the purpose for which it was designed. But although it is not possible to obtain one large enough to surmount the eye-piece, yet it is perfectly easy to procure plates of sufficient size to act as analyzing crystals upon the field or stage of the microscope, of course, used superimposed on the tourmaline, or on the artificial tourmaline attached to the stage of the instrument, and when crossed at right angles, the phenomena of polarization may be exhibited with great ease and splendour.

When the crystals have been thus arranged, and the selenite stage interposed, the field becomes coloured according to the thickness of the plate of selenite; and the extent of the field so coloured will depend on the magnitude of the superior artificial tourmaline employed. Frequently the whole field of seven or eight, or eleven inches in diameter has been coloured with one uniform tint.

In mounting the broad plates it frequently occurs that the excess of disulphates of quinine in the mother-liquid crystallizes during the drying of the object in consequence of its evaporation, under these circumstances radiating crystals of the disulphate form beneath the artificial polarizing crystal, and when such a specimen is examined with the aid of a single tourmaline below the selenite stage, as in figs. 16 and 17, the splendour of the appearance it is in vain to attempt to depict, for "who can paint the rainbow?" The analyzing crystal of the new substance develops the colour of the selenite stage employed; its whole breadth, therefore, assumes the colour of the stage, if at right angles to

FIG. 19.



the plane of the plate below, or the complimentary tint, if parallel to it. The radiating crystals of disulphate of quinine assume every hue and tint of the spectrum. The experiment must be witnessed to be fully understood and properly appreciated.

It will be recollected, that in this experiment it is not at all necessary to employ a tourmaline; the whole phenomenon may be exhibited with equal brilliancy by using the two plates of iodide of the disulphate of quinine, one as a polarizer, the other as an analyzer, the selenite stage and the disulphate of quinine being interposed, *no tourmaline was employed* in the experiment depicted.*

This will fully establish the fact of this substance possessing optical properties, precisely equivalent to those of the tourmaline or of a Nicol's prism, and will be sufficient to show that all the phenomena exhibited by the tourmaline may be produced by the new crystalline compound.

Upon submitting these artificial polarizing plates to micrometrical admeasurement, it was found that those which possessed sufficient thickness to adhere together in clusters and then to raise themselves on their edges, so as to show their thickness, were none of them more than $\frac{1}{100}$ of an inch, many of them were at least half or one-third of this thickness, therefore from $\frac{1}{100}$ to $\frac{1}{300}$ of an inch, but these were much larger than any of those thin broad plates, so readily broken, and some of which, after great trouble, were mounted and experimented with.

The tourmalines commonly sold and employed for optical purposes are from the $\frac{1}{100}$ th to the $\frac{1}{300}$ th of an inch thick, such an one as the latter was employed in the comparative experiment above related; and is generally admitted by competent judges to be a perfect gem of a crystal; it is slightly purple in tint, its size is not more than one-eighth of an inch in diameter, it is triangular in form, only capable of being used on the stage of the instrument, or at a point where the rays from the mirror are brought to a focus; whence it follows that this newly-discovered substance possesses the power of polarizing a ray of light with at least five times the intensity that the best tourmaline is capable of, it must consequently be the most powerful polarizing substance known, and has moreover been proved to be a new salt of a vegetable alkaloid.

REPORT UPON THE ALLEGED ADULTERATION OF PALE ALES BY STRYCHNINE.

BY PROFESSORS GRAHAM AND HOFMANN.

HAVING undertaken at the request of Mr. Allsopp an inquiry into the purity of bitter beer with particular reference to its alleged adulteration by strychnine, we now submit the results which we have obtained upon the subject.

Strychnine or strychnia, the alleged substitute for the hop, is a fine crystallizable substance, extracted from *nux vomica*, and belonging to the class of vegetable principles termed alkaloids, of which quinine from Peruvian bark, and morphine from opium, are the most familiar examples. These substances, although susceptible of the most valuable medical application in small doses, are, generally speaking, remarkable for their energy as poisons, and for the intense bitterness of their taste—two properties which are developed in strychnine in the highest degree. Half a grain of the latter substance would poison, and the bitterness of the same minute quantity is perceptible in every drop of six or eight gallons of water, in which it is dissolved.

It may be stated at once, that the quantity of strychnine, which we find necessary to impart to beer the degree of bitterness possessed by pale ales, is for a gallon of beer one grain of strychnine, or double the fatal dose. The price of strychnine

* The manuscript was accompanied by a beautiful drawing of this experiment; but it has been found impossible to insert this diagram.—EDITOR.

is about 16s. the ounce, which does not amount to so much as one penny per grain. Estimating the annual production of pale ale in Burton as 200,000 barrels, the strychnine required as a bitter would amount to 16,448 ounces, and cost £13,158; while nobody believes that so much as 1,000 ounces of strychnine are manufactured over the whole world. The bitterness obtained by means of strychnine is equal in degree to that of the hop, but very different in kind, and easily distinguished when the two bitters are compared. The bitter of the hop is immediate in its action upon the palate, is accompanied by a fragrant aroma, and soon passes off; whilst that of strychnine is not so instantaneous; but when the impression is once communicated, it is more lasting, and becomes, from its persistence, like that of a metallic salt. The bitter of strychnine is, indeed, easily distinguishable from that of the hop, when deliberately tasted.

Still it would be highly desirable to be able to identify strychnine in beer, by the actual extraction of the substance, and the application to it of a chemical test of absolute certainty. Fortunately those poisons which have the most violent action upon the animal economy possess often also the best marked reactions, or their physiological and chemical properties are equally salient. Thus arsenic and hydrocyanic acid are the most easily detected of chemical substances; and strychnine proves to be not far behind them in this respect.

A quantity of strychnine, not exceeding $\frac{1}{1000}$ of a grain, is tested and recognised to be strychnine in the following manner:—the powder is moistened with a single drop of undiluted sulphuric acid, and a small fragment of chromate of potash placed in the liquid. A beautiful and most intense violet tint immediately appears at the points of contact, and is speedily diffused over the whole liquid. Although most intense, the colour disappears entirely again in a few minutes. The admixture of the smallest quantity of organic matter, however, interferes with the success of the process. In order to apply the test, in operating upon a complex liquid like beer, the strychnine must first be extracted from the liquid and obtained in a pure or nearly pure condition. This difficulty, which appears at first considerable, may be readily surmounted, and the strychnine, if it really exist in beer, be separated, and its nature established in the most certain manner.

For this purpose, two ounces of ivory-black, or animal charcoal, were shaken in half a gallon of beer to which half a grain of strychnine had been purposely added. After standing over night, the liquid was found to be nearly deprived of all bitterness; the strychnine being absorbed by the charcoal. The liquid was now passed through a paper-filter, upon which the charcoal containing the strychnine was collected and drained.

The next step was to separate the strychnine from the charcoal. This was readily effected by boiling the mixture for half an hour in eight ounces of ordinary spirits of wine, avoiding loss of alcohol by evaporation. The spirits which now contained the strychnine were next filtered, and afterwards submitted to distillation. A watery fluid remained behind, which contained the strychnine, but not sufficiently pure for the test. The final purification was accomplished by adding a few drops of potash to the watery fluid, and then shaking it with an ounce of ether. A portion of the ethereal solution evaporated upon a watch-glass, left a whitish solid matter of intense bitterness, and this was recognized to be strychnine, by giving the violet tint previously described, upon the application to it of sulphuric acid and chromate of potash.

Having satisfied ourselves by repeated experiments with samples of beer to which strychnine had been previously added, of the never-failing efficiency of the above method of extraction, we now proceeded to the actual examination of the commercial article. With this object, a series of samples were taken indiscriminately from the stores of twenty-six of the London bottlers, who supply the public with Allsopp's pale ale, and from whom we have documents in hand proving the origin of the beer, and the date of its arrival at their stores.

It may be stated, that with the exception of five varieties specially indicated,

the casks from which these samples were taken had been received before the 20th of March, i. e., the period when the possible use of strychnine in the manufacture of bitter beer was first brought before the English public.

Not one of these varieties of beer, when tested with the greatest scrupulousness gave the slightest evidence of the presence of strychnine.

The charge of adulteration of beer by strychnine has been proposed in a manner so vague, that it is difficult to fix it, and try its validity. The existence of the adulteration is not alleged in any particular sample of beer, nor the practice ascribed to any individual brewer or dealer. An English journalist adopts the charge, upon the report that such an opinion is entertained and expressed by a French Chemist of distinction, M. Payen, in his public lectures at Paris. From this gentleman we have since obtained explanations which define more closely the kind of charge which was actually made by him. The late M. Pelletier, the well-known manufacturer of organic products in France, had received at one time an order for an extraordinary quantity of strychnine, of which the destination was at first unknown to him; but which he afterwards learned had been entirely exported to England, and used, as he informed M. Payen, to complete the bitter of certain kinds of beer.

We have reason to know, although it is not stated by M. Payen, that these remarks of Pelletier refer to a period ten or twelve years past; and further, although not informed of the amount of the order, we have good authority to state that fifty or a hundred ounces would have been considered a large order for strychnine at that time. The calculation already given, shows how utterly insignificant such a supply of strychnine would be for its imagined application in the pale ale breweries. It is likewise known that the manufacture of strychnine has not been on the increase in France of late years.

M. Payen excuses his statements on the ground that similar suspicions are conveyed in a French work, on *Alterations and Falsifications*, by Chevallier, published nearly a year ago, but which have not hitherto received any formal contradiction in England. Notwithstanding the latter circumstance, our distinguished correspondent concludes by expressing his regret that he ever said "that the fraud appeared to have been practised," although he had added the remark at the time, "that this falsification had no doubt ceased."

It thus appears, that the charge which has been put into the mouth of M. Payen was never made at all by that gentleman, so far as it applies to the present practice of English brewers, and with reference to anterior times, that the charge reposes simply and exclusively upon the privately expressed opinion of a deceased Chemist, the grounds of which are entirely unknown to the world, and must ever remain so.

In conclusion, it is scarcely necessary to refer to the sifting nature of the chemical examination which the beers of your own manufacture for many months past have been subjected to, and which establish their uncontested purity. Indeed, no one who has witnessed, as we have done, the open manner and gigantic scale in which the operations are conducted in such an establishment as yours, could entertain the idea for a moment, that any practice involving concealment was possible. But even in the absence of all such scrutiny, the idea of strychnine being mixed with beer anywhere, or in any circumstances, involves an amount of improbability which might well dispel all suspicion on the subject.

There is an Act of Henry VII., which prohibits the *adulteration* of ale by brimstone or *hops*. The place of the hop was then supplied by sage, horehound, chamomile, and other indigenous bitter plants. Since that period, the character of the national beverage must have undergone a silent revolution, for all varieties of beer, both pale and brown, now owe their distinctive properties to the hops which are boiled in the malt-infusion, and fermented along with it, as completely as wine owes its peculiar character to the grape. Substitute any other bitter for the hop, and the fermented wort would no longer be recognised as beer.

Were mere bitters all that is required, it would be easy to prove that the

extract of quassia would supply a bitter which is perfectly harmless and agreeable, and infinitely less expensive than strychnine.

But the process of brewing pale ale is one in which nothing but water, the best malt and hops of the first quality are used, and is an operation of the greatest delicacy and care, which would be entirely ruined by any tampering with the materials employed. Strychnine could not fail to be rejected, from the ungrateful, metallic character of its bitterness, independent of all objections of a more serious kind. This peculiarity of taste is also calculated to betray its presence. Small, too, as the proportion of strychnine may be, which is necessary to impart the degree of bitterness of pale ale, the quantity rises, as has been seen, to a poisonous dose in half a gallon of the fluid; and as this poison is one of those which are known to accumulate in the system, its poisonous action would inevitably follow, in occasional cases, upon the consumption of much smaller portions of beer, when continued for many days without intermission. The violent tetanic symptoms of poisoning by strychnine are also such as could scarcely fail to excite suspicion and alarm. Add to these disadvantages, the certainty of the means of detecting strychnine in beer by the chemical tests described above, which any Medical Man or Practical Chemist can apply, and the chance of the use of so dangerous a substance for any purpose of adulteration, becomes in the last degree improbable.

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ON THE MOUNTING OF MICROSCOPIC OBJECTS.

BY MR. HENRY DEANE,

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IN the *Edinburgh Monthly Journal of Medical Science*, is a translation of an article by Harting, of Utrecht, on making and preserving microscopic preparations, which, although intended more especially for the use of anatomists and members of the medical profession, may nevertheless come under the notice of, and be found useful to, students of Botany, *Materia Medica*, and Chemistry. For this reason, and knowing that there are objections to some of the means proposed for mounting such objects as are likely to come under the notice of the Pharmaceutical Chemist, to whom a good microscope is now an indispensable instrument, I forward the following observations for insertion in the Journal.

The author very justly observes that "most objects require to be mounted in some fluid," and proposes a series of such as he has found useful and efficient; but one who has had any experience whatever in the art of mounting objects knows full well how frequently a choice and carefully prepared object so mounted has in the course of a few months become spoiled by the escape of the fluid contents of the cell. Such accidents are by no means confined to the unskilful, for the most careful manipulators are liable to them. The escape of the fluid takes place not more frequently from any fault in the construction of the cell than from the mode in which the glass slide, containing the object, is wiped before placing it under the microscope or replacing it in the cabinet. On wiping the upper surface it is rarely that any mischief is done, great care being taken to avoid deranging it; but when the other side comes under the operation, it is not unusual to hold the slide by the two ends between the thumb and finger, when the pressure employed is sufficient to slightly bend the glass, and cause the cell on the other side partially to spring from its place and thus to afford unobserved a means for the fluid to escape. To obviate this and some other objections to the use of fluids, I was induced some months since to contrive a new medium for mounting objects in, or rather to carry out a suggestion made by Mr. Wenham, a gentleman to whom microscopists are much indebted for important improve-

ments and additions to the microscope. The method of its preparation, together with some observations on its use, were read to the Microscopical Society at the time, and as I consider it particularly applicable to mounting sections of wood, fresh vegetable, and other substances, that are usually mounted either dry, in Canada Balsam, or in fluid, the last medium only enabling the observer to see the true character of the object, it is now offered to your readers as a convenient and efficient substitute for fluids, possessing many advantages over the latter, and unattended with the disastrous liability to leakage. It may be prepared as follows :

Gelatine of best quality	1 ounce
Honey	5 "
Distilled water	5 "
Rectified spirit of wine	$\frac{1}{2}$ "
Kreasote	6 drops.

Dissolve the gelatine in the water by heat, then add the honey previously made boiling hot. When sufficiently cool add the kreasote dissolved in the spirit. While still hot it must be filtered through coarse filtering paper, or very fine and close flannel. White of egg may be used to assist in clearing it. This, when cold, will form a stiff amber-coloured jelly, very similar in character to the material of which printers' inking rollers are made, remaining tough and flexible at all ordinary temperatures and conditions of the atmosphere. When set in hot water it becomes fluid, and in this state is to be used for mounting. For this purpose keep a portion of the medium in a one ounce bottle that will stand firmly, so that when set in a vessel of hot water it will not readily fall over. One or two instances will illustrate the manner of using it, which the operator can modify to suit his various objects and requirements. Suppose the object to be a thin section of wood, let the section be placed in distilled water, or weak spirit and water—one part of spirit to five or six of water is strong enough—to displace any air contained in its tissues; and to accomplish this purpose more effectually and speedily it may be placed, while in the liquid, under the receiver of an air pump and the air exhausted. Having prepared the object, set the bottle of medium in hot water to liquify; place the wet object on a slip of glass and slightly warm it; then, with a piece of small glass tube—about six inches long is a convenient length—previously made warm by immersion in the water used to liquefy the medium, take up a small quantity thereof and drop it on the object, which must then be covered with a suitable piece of thin glass, also made warm, and slight pressure, if needful, applied until it sets and to get rid of the superfluous medium. When quite cold the slide may be cleaned, and a little *japanners'* gold size applied round the margin of the thin glass; but this is not needful in every case, although it always secures the object against changes that may take place in consequence of evaporation of moisture from the edges when not so protected. Should the object be powdery it must be mixed with a very little water on the glass slip before putting the medium to it, and then mixed with the latter by means of any small pointed instrument immediately before covering it with the thin glass. Should the object to be mounted be thick it may be placed in a cell in the usual way, employing the medium in place of balsam or other fluid.

The medium prepared as above answers for most purposes, but there are some objects that will not bear it so strong, such as many delicate aquatic plants, as *desmidia*, *diatomania*, &c.; for these it may be reduced with a portion of distilled water until its specific gravity is judged to be brought near to what may be contained in the cells of the plants, for if it be too dense an exosmotic action takes place and spoils the beauty of the preparation.

For further information the reader is referred to the abovenamed article, and above all to Mr. John Quekett's valuable work on the microscope, wherein most known methods of preparing microscopic objects are carefully described and illustrated.

Clapham, April 20th, 1852.

DIRECTIONS FOR MAKING AND PRESERVING MICROSCOPICAL PREPARATIONS.

BY HARTING, OF UTRECHT.

[The following directions are translated, in a slightly abridged form, from different parts of Harting's work on the microscope.* They have been selected as likely to prove useful to that now numerous class of students who prosecute original researches with the aid of the microscope. Personal experience enables us to attest the value of some of these hints; and the fact that Professor Harting's unrivalled cabinet of microscopic preparations, comprising more than 6000 specimens put up with his own hands, is indebted for its completeness and preservation to the methods of manipulation here described, is sufficient evidence of their excellence.—*Trans.*]

Very few objects can be preserved unaltered when dry, and even when this is possible, as in the case of hairs, fish-scales, and the like, the method is not to be in general recommended. Such objects, when surrounded by air, possess too little transparency to permit a satisfactory definition of their component parts. It is only for preserving the scales of insects and certain *test objects*, that the dry method is useful, and even preferable, from the superior distinctness with which it enables the observer to make out the different sorts of lines upon these bodies. The simplest mode of mounting these scales for microscopical examination, is to lay a few of them upon an ordinary glass object-slide, which may be moistened with the breath, if this is found necessary to make the objects adhere to it. A glass covering-plate, of suitable thickness, is then laid upon the object; and, finally, there is pasted round both slide and cover a piece of paper, having in its centre an opening corresponding to the position of the object.

Different specimens from the organic kingdom would, if simply put up in the dry way, speedily become the prey of vegetable and animal parasites. This is the case, for instance, with sections of organs like the lungs, preserved by inflation and subsequent drying. To prevent this disadvantage, I am in the habit of moistening such preparations with oil of turpentine, which, on evaporating, leaves upon the surface a very delicate varnish-like coating, which suffices for its protection.

Most microscopical objects, however, require to be mounted in some fluid, the nature of which must be varied according to the properties of the substance which it is wished to preserve. The fluids which I employ are the following:—

I.—*Saturated Solution of Chloride of Calcium.*

1st. This solution, which must be perfectly free from traces of iron, is of very general utility, and may be employed in all cases in which the substance to be preserved is of moderate firmness or hardness. In this solution all preparations of bones and teeth, sections of hairs, feathers, fish-scales, whalebone, &c., are best preserved. It may be also used with advantage for mounting specimens of many minute animalcules provided with a hard integument, such as cheese-mites, the itch-insect, small fresh-water crustacea, and the like. It is likewise the best preservative for vegetable preparations, whose cell-walls or vessels have undergone a partial incrustation, and is also very useful for displaying the shells or *loricæ* of the siliceous bacillariæ and diatomacæ.

In using it, one only requires to lay the object on a slide, and to moisten it with a drop of the solution, taking care, at the same time, to remove the air-bells which may be formed here and there. Two pieces of paper, corresponding to the thickness of the object, are next pasted to the extremities of the slide, and the whole is then covered with a second glass plate of the same size. If it should now be found that too little fluid has been applied to the object, or that part of it has run off, a drop of the solution may be applied to the edge of the slide, and will find its way between the glasses by capillary attraction. A piece of thin paper may be inserted between the glasses, to promote the flow of the fluid towards the preparation, or to rectify the position of the object when it has become displaced.

For attaching the strips of paper to the glass sides in this and other cases, the best material that can be used is starch paste, with which a little arsenious acid is mixed, in order to prevent the formation of a species of mould which is otherwise apt to gather round the preparations.—Vol. ii., pp. 347—350.

Of late I have discovered a fault in this mode of mounting preparations. In many

* *Het Mikroscoop, deszelfs gebruik geschiedenis en tegenwoordige toestand.* Utrecht. 3 vols. 1848—1850.

which have been preserved in drops of the chloride of calcium solution, there have formed numerous branches of a species of hygroscopic, which spread from preparation to preparation, and from box to box, threatening totally to destroy all specimens which have been put up in this way. I have consequently discontinued the practice of mounting specimens in chloride of calcium solution, to which the air still has access; and when I now employ this or any other fluid, am careful to exclude the influence of the atmosphere by touching the edges of the covering-plate with a cement which I have elsewhere described (see p. 376). This procedure has the additional advantage of not requiring the use of a saturated solution; it may be diluted, in proportion to the delicacy of the specimen, with from two to ten parts of water.—Vol. iii., p. 470.

II.—*Canada Balsam.*

Many varieties of this substance are met with in commerce, differing from each other in purity and colour. The best, and which is alone suitable for the use of the microscopist, is perfectly transparent, almost colourless, and very viscid. Canada balsam is used as a preservative material in all cases when it is of importance to heighten the transparency of the object,—as in mounting specimens of pollen grains, sections of hard fruit envelopes, corals, shells, and especially injected preparations of organs which suffer no change from previous drying (see March No., pp. 245—253). It is also employed for mounting many powder-like mineral substances,—mud, containing diatomaceæ; chalk, with foraminifera, &c. Specimens of this last sort should be spread with water on the object-slide, which should then be warmed till the powder is dry. When cold, the specimen is covered with the balsam, which, if too viscid, may be brought to the consistence of syrup by the addition of a little oil of turpentine. The mixture with water may be dispensed with in the case of most other objects; but it is generally expedient to moisten them first with oil of turpentine, in order to get rid of air-bubbles which may be present, and finally to cover them with the balsam. The pasting and covering of the slides are performed just as when the chloride of calcium solution is used.

III.—*Creosote Solution.*

This fluid may be prepared either by distillation with water, or by filtering a saturated solution of creosote in one part of alcohol of s. g. 867°, after mixing it with twenty parts of water. It is useful for all preparations of muscle, cellular tissue, tendon, ligament, cartilage, sections of bones and teeth which have been treated with acid, the fibres of the crystalline lens, &c. For the preservation of adipose tissue, of the ultimate nerve-tubes, and of the blood corpuscles, it is not well adapted. Objects put up in it, after a certain time, usually acquire a brownish-yellow tint.

IV.—*Solution of Arsenious Acid.*

To prepare this solution an excess of arsenious acid is boiled with water, which is then filtered and diluted with thrice as much water. This fluid is one of the most suitable preservatives for preparations from the animal kingdom; all the tissues mentioned under the last head, and also the adipose tissue, may be kept unaltered in it; and as they acquire no yellow colour, or a far slighter tinge, during their immersion, I have of late years accorded a general preference to the arsenical over the creosote solution.

V.—*Solution of Corrosive Sublimete.*

This is prepared by dissolving one part of corrosive muriate of mercury in from 200 to 500 parts of water. The strength of the solution must be varied according to the nature of the object to be preserved; hence it is well, when the required degree of concentration is not ascertained, to put up several preparations with solutions of different strengths. This procedure is especially applicable to blood-corpuscles, which can be preserved unaltered in no other fluid with which I have experimented. Thus the blood-corpuscles of the frog require a fluid containing $\frac{1}{200}$ th of corrosive muriate; those of birds a solution of $\frac{1}{300}$ th; those of mammalia and man $\frac{1}{400}$ th.

These solutions are likewise useful for keeping the elementary parts of the brain, spinal cord, and retina, although all these structures, in whatever fluid they are put up, undergo some alteration. Cartilage, and the fibres of the crystalline lens, keep well in these fluids; but other fibrous tissues lose too much of their transparency when in contact with them. They may be used, however, for preserving muscular fibre, whose cross markings they render more distinct.

For preparations of delicate vegetable tissues, and, in general, of all tender organs in which it is desired to retain the starch globules and chlorophyl unaltered, for fresh water algæ, diatomaceæ, confervæ, infusoria belonging to the division rotifera, &c., a solution containing $\frac{1}{100}$ th of $\frac{1}{100}$ th of corrosive sublimate is the best preservative with which I am acquainted.

VI.—Solution of Carbonate of Potass.

This may be made of various strengths, with one part of the salt dissolved in from 200 to 500 parts of water, and is the best material for preserving the primitive nerve tubes. Other fibrous tissues may be kept tolerably well in it, but become more transparent than in the fresh condition. This is sometimes advantageous, as, for example, when we wish to display the respiratory apparatus of insects with the ramifications of the air-tubes.

VII.—Solution of Arsenite of Potass.

I have, in a few instances, made use of a solution of arsenite of potass in 160 parts of water, to preserve the primitive nerve-tubes. It has been found as effectual as the carbonate of potass solution.

In employing the chloride of calcium solution† and Canada Balsam, it is unnecessary to take measures to prevent the evaporation of the fluid. The first remains always fluid—chloride of calcium being a deliquescent salt; and as the outer surface of the balsam hardens, the escape of the liquid portion is prevented.

But it is otherwise with the last-mentioned preservative fluids (Nos. III. to VII.) To prevent their evaporation, it is necessary to employ a cement or luting to prevent air from having access to the fluid. Different compositions have been recommended for this purpose; but I have found none more serviceable than that employed by gilders to make gold-leaf adhere to mirror and picture-frames. The following is the receipt for the preparation of this so-called gold ground or gold-size.

Let twenty-five parts of linseed-oil be boiled for three hours with one part of red lead (*menie*) and one-third of a part of umber, and then poured off. Next take white lead and yellow ochre, well pounded and divided, and mix them together in equal proportions. Successive portions of this mixture must be added to the oil, and well rubbed up and mixed with it, till a tolerably thick fluid is formed, which must be once more thoroughly boiled.

If now a preparation has been made, which it is wished to preserve in the chloride of calcium, or any of the five last mentioned fluids, and if it can, without injury, bear a little pressure, the following manipulation is recommended:—

If the specimen is moistened with water, which during the preliminary examination is frequently the case, all superfluous fluid is in the first place removed with a little roll of bibulous paper, or with a camel-hair pencil, such as I have elsewhere recommended. The fluid at a little distance from the object may be wiped off with a cotton or linen rag, and the surface of the glass there made perfectly dry. A certain quantity of the preservative liquid is then placed upon the specimen, and this is most conveniently effected by using a dropping-flask. The amount of fluid should be such that it should afterwards perfectly fill the space beneath the covering plate; the proper quantity is soon learned by a few trials. Next (a square?) covering-plate, about two millimetres ($\frac{1}{16}$ th of an inch) narrower than the object-slide, should be laid under the centre of the latter, i.e., immediately beneath the part which it is intended to cover. A pencil is next dipped in the cement, and a square drawn with it upon the glass around the fluid containing the specimen, so that the cement shall extend from one to two millimetres ($\frac{1}{16}$ th to $\frac{1}{8}$ th of an inch) within the margins of the covering-plate. The latter is now to be placed upon the specimen, and its margins finally covered with the cement. If there is too much fluid beneath, the superfluity finds a channel for escape; an opening then takes place in the cement, below the cover, but is again closed, if care be taken to renew the application of the cement to the edges of the cover, when the superfluous fluid has been removed, or has dried up. In about two days, the outer layer of the luting will have become dry, but the inner layer remains soft for many weeks and even months. This is just what constitutes the excellence of the cement, for it never bursts and permits evaporation; and a great number of preparations which I have put up in this manner are, at the present time, after the lapse of several years, quite unaltered. It is, however,

† The author has renounced the practice of putting up preparations in this fluid, and permitting the access of air, for reasons given at page 510.

of importance that the cement shall occupy a portion of the space between the object-plate and its cover; a mere anointing of the edges of the latter is never sufficient.

If the specimen be one which will not bear pressure without injury, it must be put up in some kind of cell, the depth of which must be regulated by the thickness of the object. The covering-plate must in this case be always smaller in diameter than the space between the outer margins of the cell. First, some preservative solution is placed in the cell, and then the object is laid in it; the upper edges of the cell are then touched with a little of the *gutta percha luting*°. The cell is then completely filled, till the fluid even forms a convexity about its margins; if now the cover is applied, the superfluous moisture escapes, and no air remains in the cell. Finally, when the edges are dry, they must be covered with a thick layer of the luting, and with a second a few days afterwards.

The method last described is especially applicable to the preservation of injected specimens in a solution of arsenious acid.—Vol. ii., p. 350—355.

Preparation of Caoutchouc Cells.

In commerce we now obtain caoutchouc plates of different thicknesses. The thinnest measure about one millimetre ($\frac{1}{16}$ th of an inch), and out of these plates of any required thickness may be formed, as their surfaces adhere perfectly together, especially if previously slightly heated. In a square piece of suitable thickness an opening may be made by means of a scissors, or the centre may be cut out of a disc-shaped piece by means of a hammer and ring-shaped punch. To fasten the caoutchouc-ring to the object-slide we use the following luting:—

One part of finely cut gutta percha is mixed with fifteen parts of oil of turpentine, and dissolved in it by gently heating, and constantly stirring, the mixture. The solution is then poured through a cloth, to separate some impurities which are always to be met with in raw gutta percha. To the purified solution there is added one part of shell-lac, which, by the aid of gentle heat and constant stirring, must be dissolved in it. The heat is then kept up until a drop of the solution let fall upon a cold surface becomes nearly hard. The cement is then ready for use. If it is afterwards found requisite to melt it again, a little oil of turpentine should be added before applying the heat.

To attach the caoutchouc ring to the glass, proceed as follows:—Lay the ring upon the table, and above it place the glass object-slide, so that the ring occupies the centre of the slide, and a free margin of glass is left around it. A pencil is now to be dipped in the warm luting, and carried over the portion of the glass through which the ring is seen, care being taken to spread the luting in a thin layer, as the superfluous fluid would otherwise flow out from the edges. The ring is now removed from beneath the slide, and laid upon the spot marked out for it with the cement. The plate is next warmed by holding it over fire, and then laid, ring downwards, on a cold piece of mirror-glass till the cement has become cool and hard.

Gutta Percha Cells.

Gutta percha, which, like caoutchouc, resists the action of almost all chemical agents, has, besides, the property of becoming soft and plastic in warm water, and can thus be fashioned into any required shape, which it retains on cooling and resuming its former consistence. Gutta percha sheeting may be procured in commerce, like caoutchouc sheeting, of any thickness, and will be found very useful for microscopical purposes. Plates of this substance may be provided of various thicknesses, according to the required depth of the cells—for example, from $\frac{1}{16}$ th of a millimetre to three millimetres ($\frac{1}{16}$ th to $\frac{3}{16}$ th of an inch) in thickness. These plates must then be cut into square pieces, a little narrower than the glass slides on which they are to be fastened. The openings may be cut out with a scissors, or struck out with a punch and hammer, the plate being laid upon a piece of cork. To fasten gutta-percha rings to the glass plates the cement recommended for caoutchouc is employed, and the process conducted in the same way, with this difference, that, after the last heating, which makes the gutta percha soft again, pressure should be made upon it for a few seconds with a cold piece of mirror-glass. The upper surface of the cell is thus rendered quite flat and smooth, so that the glass cover, when applied, is every where in contact with it. In this respect the gutta-percha cells are preferable to those of caoutchouc, the upper surface of which, especially about the edges, has always some degree of convexity.—Vol. ii., pp. 125—127.—*Monthly Journal of Medical Science.*

* The reader will find the receipt for this composition, and directions for making cells of gutta percha and caoutchouc, at the end of the present article.—TRANS.

ON THE CHEMICAL COMPOSITION OF THE LIQUID CONTAINED IN THE COCOA-NUT.

BY WILHELM VON LOEWENICH, OF ERLANGEN.

(In a communication from Professor T. W. C. Martius, M.D.)

THE fruit, with its contents of the *Cocos nucifera* (*Monoecia Hexandria*, Linn., Fam. Palmaceæ), has been frequently examined; but the extensive use which, in more recent times, has been made of this fruit, especially of the fibres of the pericarp, appeared, in the present progressive state of Chemistry, to render a further examination desirable. Dr. Martius has kindly furnished me with a few cocoa-nuts, which he obtained on his visit to London, and the following experiments were performed by me under the superintendence of Prof. Gorup in his private laboratory.

I removed the pericarp, and having divided the fruit with a saw, obtained the contents quite pure. The liquid was slightly limpid, but by filtration it became as clear as water. It had a slightly acid reaction, and weighed about seven and a half ounces. Its odour was peculiar and pleasant, similar to vanilla; its taste was slightly acid, resembling that of whey. The specific gravity was not uniform, a circumstance also noticed by Buchner (*Buchner's Repertorium*, Bd. 26, p. 338; Brande's *Archiv. d. Pharm.*, Bd. 32 and 34). That of the liquid of one fruit was 1.028, and of another 1.043. This variation arises probably from the varying degree of maturity of the fruit. When heated on platinum foil, a very agreeable odour was evolved; by further heating, a considerable quantity of inorganic matter remained behind. The following phenomenon is very remarkable: when the liquid is heated, it becomes remarkably turbid, and a voluminous coagulum is formed, as in albuminous solutions; but neither by muriatic acid nor by nitric acid could the presence of albumen be detected.

In order to examine the inorganic substances, a portion of the liquid was evaporated and ignited till the ashes were perfectly white. 1000 parts yielded 99.12 of ashes. When exposed to the air, the ash became moist, and dissolved in muriatic acid, with the evolution of carbonic acid. The filtered solution, mixed with a small quantity of distilled water, was then submitted to analysis. The proportion of phosphate of lime which I detected was very remarkable, and I found that this salt was contained in considerable proportions in all parts of the fruit. Sulphate of potash, chloride of sodium, carbonates, and traces of a salt of iron, were the other substances found.

In determining the organic substances in the liquid, I directed my attention chiefly to sugar, gum, and the peculiar acid. Besides these, I found a vegetable fat, which was soluble in ether and completely saponified with potash. As I was obliged to perform the various experiments one after the other, I perceived after four days a striking change in the liquid, which I had kept in a cold place and in a well-stoppered glass vessel. The liquid, which had hitherto been clear like water, became thick and gradually gelatiniform. The acid reaction on litmus was considerably stronger than before. Suspecting from the proportion of sugar the viscous and lactic acid fermentation, I tested a portion of the liquid for lactic acid, but without success. The remaining portion of the gelatiniform mass, yielded, however, upon being distilled with a few drops of diluted sulphuric acid, a strong acid distillate, quite similar in odour to a fatty acid. This was neutralized with ammonia, and precipitated by nitrate of silver. The precipitate was dissolved in hot distilled water, and on cooling, the solution deposited shining acicular crystals. These were washed with cold distilled water, and dried at 100° C. In determining the atomic weight of this silver salt, I found that the acid which it contained, was *metacetic acid*, which is generated during the decomposition of the liquid. I found 64.7, whereas metacetic acid requires 64.6. Considering the small quantity which I employed for my experiments, the proportion of this acid was very large, and there is no doubt that

in experiments on a larger scale, many more acids of the same group will be detected. In 1000 parts of this cocoa-nut liquid, I found:—

Water	900.88
Sugar	4.43
Gum	17.67
Extractive matters (fat)	28.29
Salts soluble in spirit of wine	5.44
Salts not soluble in spirit of wine.....	6.29
	1000.00

Of the individual salts, I only determined the acids quantitatively, as the material was not enough to do the same with the bases. In 1000 parts, I found,

Hydrochloric compounds	1.706
Phosphoric acid compounds	1.633
Sulphuric acid compounds	2.29

MANNA OF THE *PISTACIA VERA*, L.

ERMAN, describing the various articles of commerce met with by him in the bazaar at Kasan, an important town in the interior of Russia (long. 49° 21' E., lat. 55° 47' N.), mentions the Manna of the *Pistacia* in the following terms: vide *Travels in Siberia*, by Adolph Erman, translated from the German by W. Desborough Cooley. London, 1848. Vol. i., page 145.

“But the Pistashi, as they are called, or else Pistashi (Pistachio nuts) bear the Bokharian name. These are pear-shaped seeds, or what botanists would call *Drupe*, about six lines in length, and two or three lines broad at the widest part, with close-fitting, yellow, parchment-like covers, and with an oily split kernel, of bright green colour.

“These pistachio nuts are usually bought here in Kasan, together with a yellowish manna, which is doubtless produced in large quantities by the plant itself; for the pear-shaped seeds are found often enough enclosed in the indurated manna, or glued together by it; so that it is obvious that both productions, the manna and the seed, were picked up at the same time from the ground at the foot of the tree.”

MEMORANDUM ON THE NUTMEG DUTY.

BY J. CRAWFORD, ESQ.

By the existing tariff nutmegs are charged with two different rates of duty; what are called “wild” with 5*d.* a pound; and all others, which of course means all cultivated nutmegs, whether of British or foreign growth, with one of 2*s.* 6*d.* a pound, or six times that amount. I have no doubt whatever but that this assessment of duty originated in the mistake of fancying that there existed two essentially distinct kinds of nutmegs, of different qualities and values. A nutmeg of a long form is charged with the lower duty, on the supposition that it was a wild one; but a round one, with the higher, because it is thought to be peculiarly a cultivated one; both having in reality this property. There is only one species of aromatic nutmeg, called by botanists *myristica moschata*. This, in the native country of the aromatic nutmeg, exists both in the wild and cultivated state, and differs only in being better grown and yielding more fruit in the last of these states. The great authority for the nutmeg, although he wrote concerning it above 160 years ago, is the celebrated Rumphius, who lived and died in the Spice Islands. Rumphius describes the true nutmeg as being a native of the Molucca and Banda Islands, but chiefly of the last of these, which consists of six petty islets. He alleges that nature has confined it to this small and remote corner of the globe in order to stimulate the industry of man, on the same principle that it has hidden gems and gold in the bowels of the earth. In its native country the nutmeg grows luxuriantly and easily, with little labour. During our occupation of the Spice Islands, on two occasions, about the beginning of the present century, we transferred the nutmeg to the British possessions Bencoolen and Penang; and, about thirty years ago, its culture was intro-

duced into Singapore. In the two British settlements the nutmeg is at present extensively grown, both by European and Chinese proprietors, but beyond these and Bencoolen the tree has never yielded fruit, either in Asia or America. Even in the western parts of the Malay Archipelago itself, although the fruit be equally good as in its native place, the culture is attended with so much risk and expense, that if the Dutch Spice trade were thrown open the probability is that it could not be carried on at all. This, however, is a matter for the consideration of the planters, and I am satisfied the Government will be ready to remove all factitious obstacles that stand in the way of their legitimate industry. The account which Rumphius gives of "the long," miscalled in our tariff "the wild," and "the round," equally miscalled cultivated, is so entirely to the point that I shall translate it. It is as follows:—"The nut itself is well known; the lower side is flat, and all over it is a little wrinkled. It is of two forms—the one oblong, the other round, both equally good, but the round usually the hardest. The true nutmeg is one only, but, as just said, of two forms. One tree, for example, will bear oblong, and another round nuts, a distinction which appears even in the leaves of the trees, one tree having them longer, and another shorter and rounder. Both nuts, however, are equally aromatic, and have the same virtues." What the natives of the Malayan countries call wild nutmegs are nutmegs (*myristica*) only as to *genus*. Rumphius enumerates six species of this kind, of which he has described two. One only of the six had a slight aromatic flavour in the nut, but none at all in the mace, or reticular envelope; the rest were utterly flavourless. Dr. Wallich informs me that he found five species in Singapore alone, every one wholly vapid and worthless as a condiment. In so far, therefore, as commerce is concerned, there is no such thing as "a wild nutmeg," except in the English tariff. It will appear from the price-currents that no distinction into wild or cultivated is made in the trade; but it would seem that at the Custom-house nutmegs of a long form are imagined to be wild, and admitted at the low, while the round, fancied to be the only cultivated ones, pay the high duty. Neither is there, as we might conclude from the equal quality attributed to them by Rumphius, any difference in their value and appreciation in the English market, the long very often fetching the highest price in bond, caused, no doubt, by their being more applicable, with the low duty, for home consumption. The result of the difference of duty turns out to be highly detrimental to the produce of the British possessions. This consists entirely of round nutmegs, whereas that of the Dutch is composed of both sorts, the long being selected for the English market for the benefit of the lower duty, and finding their way to it through Batavia and Singapore, as well as the European ports of Holland. The difference between the two rates of duty of 5*d.* and 30*d.* is, of course, 25*d.*, so that on two commodities of exactly the same value there may be an excess of 500 per cent. on one of them, and this one happens to be the product of a British possession competing with that of a foreign one. In the price-current of the *Economist* of the 14th of January, 1852, there are, without any distinction of wild or otherwise, four quotations varying from 9*d.* up to 3*s.* 9*d.* In another printed London price-current in my possession there are also four quotations for January, 1851, and the same number for January, 1852, the lowest for 1851 being 2*s.* 3*d.* and the highest 3*s.* 6*d.*; while for 1852 the prices were respectively 1*s.* 6*d.* and 3*s.* 3*d.*

These meagre quotations do not give an adequate notion of the real state of the nutmeg market, and therefore I refer to an actual account of sales of fourteen cases of Penang nutmegs, sold on the 12th of December last, by Messrs. Crawford, Colvins, and Co., of the city, and which is now before me. The nutmegs amounted to 2,405 pounds weight, and the gross price which they fetched was £217 19*s.* 9*d.*, which gives an average of 1*s.* 9½*d.* per pound, which may be called 1*s.* 10*d.*, as four out of the fourteen cases were sold exactly at this price. In the fourteen cases there were ten quotations, ranging from 7*d.* the lowest (a damaged lot) up to 2*s.* 4*d.* the highest. On the average price of 1*s.* 10*d.*, the duty on these nutmegs, which were the produce of Penang, and consequently "all round," was 2*s.* 6*d.* a pound, equal to an *ad valorem* duty, in round numbers, of 136 per cent. Had the nutmegs been long, they would have been of the same value in bond, and the Custom-house, calling them "wild," would have assessed them at 5*d.* a pound, so that the *ad valorem* duty on them would have been between 22 and 23 per cent. only. The flagrant injustice of continuing the present rate of duty is, I think, certain. The quantity of nutmegs taken out of bond in 1851 was 194,132 pounds, and the revenue £21,913. At 2*s.* 6*d.* a pound, it ought to have amounted to £24,266, so that the revenue lost (the consumption being

supposed to be the same) the sum of £2,453. If practicable, it would be expedient to ascertain at the Custom-house the quantities of nutmegs that paid respectively the 5*d.* and 30*d.* duty, as also the rate of consumption of each kind for a period, say of ten years. As an *ad valorem* duty is obviously impracticable, I would suggest that the same rate of duty should be imposed on all nutmegs, since it is beyond doubt that their quality is essentially the same, and that all alike are the product of cultivation, their market values differing only in degree, according to season, and skill in growing and curing, as it is with any other article of culture. In cloves, for example, the same duty of 6*d.* per pound is imposed, although the prices, quoting from those of the present month of February, as given in the *Economist*, range from 6*d.* a pound up to 1*s.* 2*d.* Mace is a still more remarkable example. The duty is the same as that on the round nutmeg, although the prices range from 1*s.* 6*d.* to 2*s.* 9*d.* Neither is there any distinction drawn between the duty on mace of the long or so-called wild nutmeg, and that of the round, although if there were any sense in the distinction of duty between the two sorts of nutmegs, it ought equally to have been applicable to their maces; for the mace differs but little from the fruit it belongs to. I will only give one other example, that of coffee. The same duty of 28*s.* a cwt. is charged on every price ranging from 36*s.* to 88*s.* There is clearly no reason for making nutmegs an exception. I am of opinion that it would be expedient to lower the duty on nutmegs, as well as to assimilate it on all nutmegs. The duty on the corresponding article of cloves is 6*d.*, and as nutmegs are about twice the value of cloves, a duty of 1*s.* a pound on them, would, I think, be a just and fair one. This, on the consumption of 1851, would yield a revenue of £9,706, or a defalcation of £11,207, which, however, would be greatly diminished by the increase of consumption resulting from so large a reduction as 1*s.* 6*d.* a pound. Such an increase would only be consonant with what has taken place in every other article of general consumption on a large reduction of duty, such as tea, coffee, and cocoa. Nutmegs themselves are a striking case in point. Up to 1819, the duty had been 5*s.* 5*d.* a pound, and the consumption about 50,000 only. In that year it was reduced to 2*s.* 6*d.*, and to this must be ascribed the enormous increase of 246 per cent. which has taken place in thirty years' time.

Athenæum Club, Pall Mall, February 23, 1852.

CULTIVATION OF NUTMEGS AND CLOVES IN BENCOOLEN.*

BY DR. LUMSDAINE.

THE mode of culture adopted in the different nutmeg plantations is nearly the same. The beds of the trees are kept free from grass and noxious weeds by the hoe, and the plough is occasionally run along the interjacent spaces for the purpose of eradicating the Lallang (*Andropogon caricosum*), which proves greatly obstructive to the operations of agriculture. The trees are generally manured with cow-dung and burnt earth once a year in the rainy season, but the preparation of suitable composts and their mode of application are but imperfectly understood. The pruning knife is too sparingly used; very few of the planters lop off the lower verticils of the nutmeg-trees or thin them of the unproductive and straggling branches.

The site of a plantation is an object of primary importance, and doubtless the alluvial grounds are entitled to preference from the acknowledged fertility of their soil, and its appropriate organization and capability of retaining moisture, independent of the advantage of water carriage. Several of the nutmeg-trees of the importation of 1798 at Moco Moco, are placed in soil of this description; although never manured they are in the highest state of luxuriance, and bear abundantly; and I have been informed by a gentleman recently arrived from that station, that the stem of one of them measures thirty-eight inches in circumference. Some of the trees in my own experimental garden corroborate the truth of this assertion; one of these blossomed at the early age of two years ten months and a half, a degree of precocity ascribable solely to its proximity to the lake which forms the southern boundary. This was the first tree that blossomed of the importation of 1803, which consisted of upwards of 22,000 nutmeg plants. Next to the alluvial deposits, virgin forest lands claim pre-eminence, their surface being clothed with a

* From a Paper in the Proceedings of the Agricultural Society, established in Sumatra in 1820; cited from the *Journal of the Indian Archipelago and Eastern Asia*, v., p. 78, Jan., 1851.

dark-coloured carbonized mould, formed by the slow decay of falling leaves and mouldering trunks of trees; and next to these are to be ranked the open plains. Declivities are objectionable from the risk of the precipitation of the mould and manure into the subjacent ravines, by the heavy torrents of rain that occasionally deluge the country. Above all, the plantation must be protected from the southerly and northerly winds by a skirting of lofty trees, and if nature has not already made this provision, no time should be lost in belting the grounds with a double row of the *Casuarina littorea* and *Cerbera manghas*, which are well adapted for this purpose. This precautionary measure will not only secure the planter against eventual loss from the falling off of the blossom and young fruit in heavy gales, but will prevent the up-rooting of the trees, a contingency to which they are liable from the slender hold their roots have in the soil. If the plantation is extensive, subsidiary rows of these trees may be planted at convenient distances. No large trees whatever should be suffered to grow among the spice trees, for these exclude the vivifying rays of the sun and arrest the descent of the salutary night dews, both of which are essential to the quality and quantity of the produce. They further rob the soil of its fecundity, and intermingle their roots with those of the spice trees. It is true that by the protection they afford they prevent frequently the premature bursting of the husk, occasioned by the sudden action of a hot sun upon it when saturated with rain; but the loss sustained in this way is not equal to the damage the spice trees suffer from these intruders. Extensive tracts of land are to be met with in the interior of the country, well adapted for the cultivation of the nutmegs and cloves, and to these undoubted preference is due.

In originating a nutmeg plantation, the first care of the cultivator is to select ripe nuts, and to set them at the distance of a foot apart in a rich soil, merely covering them very lightly with mould. They are to be protected from the heat of the sun, occasionally weeded, and watered in dry weather every other day. The seedlings may be expected to appear in from thirty to sixty days, and when four feet high, the healthiest and most luxuriant, consisting of three or four verticels, are to be removed in the commencement of the rains to the plantation, previously cleared of trees and underwood by burning and grubbing up their roots, and placed in holes dug for their reception, at the distance of eighty feet from each other, screening them from the heat of the sun and violence of the winds. It is a matter of essential importance that the ground be well opened and its cohesion broken, in order to admit of the free expansion of the roots of the tender plants, and that it be intimately mixed with earth and cow manure, in the proportion of two-thirds of the former to one-third of the latter. The plants are to be set in rows as well for the sake of regularity as for the more convenient traversing of the plough, which is now to be employed in clearing the intermediate spaces of Lallang and other noxious grasses, carefully avoiding to trespass on the beds of the trees. They must be watered every other day in sultry weather, manured annually during the rains with four garden baskets full of the above-mentioned compost to each tree, and protected from the sun until they attain the age of five years. They will now be sufficiently hardy to bear the sun, and from that age until their fifteenth year the compost should consist of equal parts of cow-dung and burnt earth, and from eight to twelve baskets full will be required for each bearing tree, a lesser proportion being distributed to the males. From the power of habit the trees will, after the fifteenth year, require a more stimulating nutriment; the dung ought not, therefore, to be more than two or three months old, and the mixture should consist of two parts of it to one of burnt earth, of which the suitable proportion will be from twelve to sixteen baskets to each tree biennially. In all cases the prepared compost must be spread out in the sun for three or four days previous to its application, in order to destroy grubs and worms that may have lodged in it, and which might injure the roots of the plants.

In all plantations, whether situated in forest land or in the plains, the necessity of manuring at stated intervals has been found indispensable, and is indeed identified with their prosperity. The proper mode of applying it is in a circular furrow in immediate contact with the extremities of the fibrous roots, which may be called the absorbents of the plant. Where there is a scarcity of dung, recourse may be had to the dregs remaining after the preparation of the oil from the fruit of the *Arachis hypogæa*, which in mixture with burnt earth is a very stimulating manure; or composts may be formed from the decomposition of leaves or vegetable matter of any description. A very fertilizing and highly animalized liquid nutriment for plants is obtained by macerating human ordure in water in proper pits for four or five

months, and applying the fluid to the radical absorbents of the plants. Seaweed and many other articles may also be resorted to, which will readily occur to the intelligent agriculturist.

During the progressive growth of the plantation, the beds of the trees are to be regularly weeded and the roots kept properly covered with the mould, for these have a constant tendency to seek the surface; the growth of the lateral branches alone is to be encouraged, and all suckers, or dead and unproductive branches, are to be removed by the pruning-knife, so as to thin the trees considerably, and to admit of the descent of the night dews, which are greatly contributive to their well-being, especially during the dry and sultry weather; creepers are to be dislodged, and the lower verticels lopped off, with the view of establishing an unimpeded circulation of air. The conclusion of the great annual harvest is the fittest time for pruning the trees. After the eradication of the Lallang, the growth of innoxious grasses is to be encouraged in the intervals between the trees, which will give the plantation the appearance of a park, and the plough is now to be abandoned.

The nutmeg-tree is monœcious as well as diœcious, but no means of discovering the sexes before the period of inflorescence are yet known. The relative proportion of male and female trees to each other is also undefined, and is indeed the result of chance. Setting aside, however, all pretension to mathematical precision, the number of productive trees may be roundly estimated at two-thirds of the whole cultivation. As the monœcious plants are productive, the number of male trees necessary to be retained will depend entirely on that of the monœcious kind; all above this number being considered superfluous, should be cut down and other trees planted in their stead. Were I indeed to originate a nutmeg plantation now, I should either attempt to procure grafts on male stocks on such trees as produce the largest and best fruit, by the process of inarching, notwithstanding the speculative hypothesis of the graft partaking of the gradual and progressive decay of the parent tree, leaving a branch or two of the stock for the purpose of establishing a regular polygamy, by which means the plantation would consist of monœcious trees only; or I should place the young plants in the nursery at the distance of four feet from each other, and force them to an early discovery of their sex, by lifting them out of their beds once a year and replacing them in the same spot, so as to check the growth of wood and viviparous branches. The sex might thus be ascertained on an average within the fourth year, and the trees removed to the plantation and systematically arranged, whereas in the usual mode of proceeding it is not ascertainable in general before the seventh year.

Upon an average the nutmeg-tree fruits at the age of seven years, and increases in produce till the fifteenth year, when it is at its greatest productiveness. It is said to continue prolific for seventy or eighty years in the Moluccas, but our experience carries us no further than twenty-two and a half years, all the trees of which age that have been properly managed are still in the highest degree of vigour and fecundity; and for this reason no term for planting a succession of trees can as yet be fixed upon. Seven months in general elapse between the appearance of the blossom and ripening of the fruit, and the produce of one bearing tree with another under good cultivation may, in the fifteenth year of the plantation, be calculated at five pounds of nutmegs, and a pound and a quarter of mace. I have observed, however, that some trees produce every year a great quantity of fruit, whilst others constantly give very little. It bears all the year round, but more plentifully in some months than in others. The great harvest may generally be looked for in the months of September, October, November, and December, and a small one in April, May, and June. Like other fruit-trees on this portion of Sumatra, I have remarked that it yields most abundantly every other year. The fruit having ripened, the outer integument bursts spontaneously, and is gathered by means of a hook attached to a long stick, and the mace being cautiously stripped off and flattened by the hands in single layers, is placed on mats for three or four days in the sun to dry. Some planters cut off the heels and dry the mace in double blades, from an opinion that the insect is apt to breed in or about the heels, and that the double blade gives a better and more substantial appearance to the mace. The former idea is entirely groundless, for if the article be properly cured, kept in tight packages in a dry situation, and exposed to the sun for five or six hours once a fortnight, there need be no apprehension of the insect; and if it is not it will assuredly be attacked by it whether the heels be cut off or not. Again, the insect is much more likely to nestle within the fold of the double blade, and the fancied superiority of appearance has so

little weight with the purchaser, as not to counterbalance the risk of probable deterioration and eventual loss. In damp and rainy weather the mace should be dried by the heat of a charcoal fire, carefully conducted so as not to smoke it or blacken its surface.

The nuts liberated from their mace envelope are transported to the drying-house, and deposited on the elevated stage of split neebongs, placed at a sufficient distance from each other to admit of the heat from a smouldering fire beneath, without suffering even the smallest nuts to pass through. The heat should not exceed 140° of Fahrenheit, for a sudden inordinate degree of heat dries up the kernels of the nuts too rapidly, and its continued application produces fissures in them, or a fermentation is excited in them which increases their volume so greatly as to fill up the whole cavity of the shell, and to prevent them from rattling when put to this criterion of due preparation. The fire is lighted in the night. The smoking-house is a brick building of a suitable size, with a terraced roof, and the stage is placed at an elevation of ten feet from the ground, having three divisions in it for the produce of different months. The nuts must be turned every second or third day that they may all partake equally of the heat, and such as have undergone the smoking process for the period of two complete months and rattle freely in the shell, are to be cracked with wooden mallets, the wormeaten and shrivelled ones thrown out, and the good ones rubbed over simply with recently prepared well-sifted dry lime. They are now to be regarbled, and finally packed for transportation in tight casks, the insides of which have been smoked, cleaned, and covered with a coating of fresh water and lime. If packed in chests, the seams must be dammed to prevent the admission of air or water. There is no necessity for sorting them, as previously to their sale they are classed into sizes in the company's warehouses in London.

The mode generally practised in preparing nutmegs for the market is to dip them in a mixture of salt water and lime, and to spread them out on mats for four or five days in the shade to dry. I am, however, convinced, from much experience, that this is a pernicious practice, not only from the quantity of moisture imbibed in this process encouraging the breeding of insects and rendering the nuts liable to early decay, but from the heating quality of the mixture producing fissures and occasioning a great loss in the out turn; whereas, by limiting them simply in the dry way as I have recommended, the loss ought not to exceed eight per cent. In May, 1816, I made some experiments on this subject. I cracked a quantity of nutmegs that had been smoke-dried for two months, and distributed them into four equal portions. I prepared the nuts of one parcel with a mixture of lime and salt water; those of the second were rubbed over merely with fine well-dried shell lime, such as the natives use with their betel, although I have no doubt but that recently-prepared and well-sifted common lime would answer equally well; those of the third parcel were mixed, unlimed, with one-third of their weight of whole black pepper; and those of the fourth, also unlimed, with the same proportion of cloves. They were then put into separate boxes with sliding tops, and numbered 1, 2, 3, and 4, in the order I have mentioned them. At the expiration of the first year they were all sound. After that of the second, I found three worm-eaten nuts in No. 1, and two in No. 3, but those in Nos. 2 and 4 remained untouched. The injured nuts were allowed to remain, and after the lapse of the third year, five wormeaten ones were discovered in No. 1, three in No. 3, and two in No. 4, those in No. 2 being in their original state. Four years and four months have now elapsed since the commencement of these experiments, and upon examining the several parcels the other day, the number of decayed nuts has not increased in Nos. 1, 3, and 4, and those in No. 2 are as good as the day they were put into the box. These experiments not only prove the superiority of liming in the dry way, but also the fact that the progress to general decay in a heap of nutmegs, even after the insect has established itself, must be a work of years. In the shell they will keep for a great length of time. I have myself kept them in this state for six years, and when cracked they were found perfectly sound. From the report of the London brokers, however, they will not answer in Europe on account of the heavy allowance for shells, which is one-third of the weight; but the Chinese merchants are in the daily habit of exporting them to Penang and China, where they are in request. It is stated on the best authority, that unlimed or brown nutmegs, as the home dealers call them, mixed with cloves as in experiment No. 4, are highly esteemed in England, and even preferred by some to the limed produce; most probably from the greater facility of detecting the flaws in them in their naked state.

Although the clove-tree attains great perfection in the red mould of these districts, it is more partial to a less tenacious soil. Its cultivation has been established for many years in the West Indies and at Bourbon, and is of secondary importance only. The mother-cloves are planted in rich mould at the distance of twelve inches from each other, screened from the sun and duly watered. They germinate within five weeks, and when four feet high are to be transplanted at intervals of thirty feet, with a small admixture of sand with the red mould so as to reduce its tenacity, and to be cultivated in the same mode as the nutmegs, only that when full grown they require less manure in the proportion of one-third. They yield generally at the age of six years, and at that of twelve are in their highest state of bearing, when the average produce may be estimated at six or seven pounds of marketable fruit each tree during the harvest, which takes place in the rainy months, but with us they have hitherto borne two crops in three years only. The fruit is terminal, and when of a reddish hue is plucked by hand, so that the process of gathering it is tedious. It is then dried for several days on mats in the sun, until it breaks easily between the fingers, and assumes a dark brown colour. It loses about sixty per cent. in drying. When past its prime the clove-tree has a ragged and uncombed appearance, and I am led to suppose that its existence is limited to twenty years, unless in very superior soil, in which it may drag out a protracted and unprofitable state of being to the period of perhaps twenty-four years. Hence it becomes necessary to plant a succession of seedlings when the old trees have attained eight years of age, and this octennial succession must be steadily kept in view.

With reference to the number of labourers, cattle, and ploughs necessary for a plantation of 1000 nutmeg and clove-trees, after the ground has been thoroughly cleared of underwood and stumps of trees, I consider that seven Chinese or active Bengalee labourers, fifty head of cattle, and two ploughs, would be sufficient for all the purposes of the cultivation, with the exception of collecting the clove harvest, which, being a very tedious process, would require an extra number of hands; and, indeed, the best plan would be to gather it in by contract—*American Journal of Science and Art*.

ON THE CULTIVATION OF THE NUTMEG AT SINGAPORE.

BY BERTHOLD SEEMANN.

THE cultivation of the nutmeg has lately been prosecuted here with great zeal. When the settlement was established, much prejudice existed with respect to it. A general belief then prevailed, that with so great an investment of capital which such plantations require, and without protecting laws, much risk was incurred. Now, however, the fallacy of these views has been demonstrated. Several far-sighted individuals, who early commenced the cultivation of the spice, are now reaping a golden harvest from their enterprise. Others have been induced to follow their example, for it has been found that the Singapore planters, with free labour, and without protecting laws, are enabled to produce their nuts and mace at a cheaper rate than the Dutch, with all their antiquated institutions. Another decisive proof, if any indeed was wanting, that industry only desires to be free and unfettered, in order to be productive of the best results.

The perseverance, care, and foresight which are required in order to cultivate the nutmeg successfully, are truly astonishing. The preparation of the soil, manuring, shading of the young plants, &c., are very laborious operations, and how often do they meet with disappointment! After years of attention and the expenditure of great sums, the trees begin to blossom, when, alas! not unfrequently more than one-half turn out to be either male or monocious plants, only to be felled by the axe. This circumstance is of great importance; in order to remedy the evil, various experiments have been made to propagate the female plants by grafting or by layers; and, although these processes have been successful, it remains yet to be ascertained whether trees multiplied in this way are as productive as those raised from seeds*.—*Hooker's Journal of Botany*.

* See an excellent account of the Nutmeg and its cultivation, by Dr. T. Oxley, in the *Journal of the Indian Archipelago*, vol. ii., p. 641—661.

ON THREE KINDS OF QUININE.

BY J. VAN HELJNINGEN.

If common pure quinine be dissolved in absolute alcohol and the latter allowed to evaporate spontaneously, a resinous mass remains behind, in which acicular crystals are contained. If it be dissolved in ether, there also remains after the evaporation a resinous substance, but in which these crystals cannot be discovered.

According to Martiny and Liebig common quinine is obtained in crystals from an ammoniacal liquid. These are most easily procured when ammonia in excess is added to a solution of the neutral sulphate of α quinine and of the sulphate of quinine with three atoms of water, and the mixture set aside. After some time very fine acicular crystals appear on the surface, which can be isolated only with difficulty, and when washed and dried form an amorphous powder. But from absolute alcohol these crystals no more crystallize than does amorphous quinine.

If, however, recently-precipitated quinine, after having been carefully washed and repeatedly moistened, be spread out as thinly as possible and exposed to the air, the amorphous precipitate is gradually converted into crystals, which can be as easily recrystallized from absolute alcohol as quinine.

This amorphous precipitate, however, which is the third hydrate of quinine, loses during crystallization two equivalents of water and possesses now, like the first hydrate of quinine, the property of being much less soluble in spirit of wine, and of crystallizing out of the hot alcoholic solution by cooling. This quinine recrystallized from alcohol and procured, as described above, by precipitation from the common sulphate of quinine by ammonia, loses, when moistened with ammonia, and exposed for a few days to the air at 130° Cent., five per cent. of water.

Quinine	94.935	1=2025.0	94.8
Water.....	5.065	1= 112.5	5.2
	100.000	2137.5	100.0

It follows, therefore, that there are three kinds of quinine which are quite distinct the one from the other, and show their peculiarity also in their salts, namely—

α quinine, which loses at 130° C., 14.3 per cent. water = 3 eq.

β quinine, which loses at 130° C., 10.8 per cent. water = 2 eq.

γ quinine, which loses at 130° C., 5.2 per cent. water = 1 eq.

The γ quinine forms like the α and β quinine, basic and neutral salts, which easily crystallize, and have much similarity with those of β quinine. The basic sulphate of this alkaloid contains much less water than the corresponding salt of the α and β quinine. Analysis showed

γ quinine	84.78 =	4050.0	84.81
Sulphuric acid	10.75 =	500.0	10.47
Water.....	4.47 =	112.5	4.71
	100.00	4662.5	100.00

The proportion of water in the corresponding sulphate of α quinine, is 14 per cent., or seven equivalents; that of β quinine, 12.9 per cent., or six equivalents; and that of γ quinine, 4.70 per cent., or one equivalent.

The γ quinine is easily prepared, and of importance for the purification of the α quinine, as it crystallizes, and can, therefore, be more easily purified.

It establishes, moreover, the presence of the β quinine beyond doubt, since it is now quite certain that all three arise from one another. For the sake of greater order, the denomination ought now to be altered, and α quinine should be called that with one atom of water; β quinine that with two atoms; and γ quinine that with three atoms of water.—*Pharm. Central Blatt*.

ON TWO VARIETIES OF FALSE JALAP.

BY JOHN H. CURRIE.

Two different roots have for some time back been brought to the New York market for the purpose of adulterating or counterfeiting the various preparations of jalap. They differ materially from the Mechoacan and other varieties of false jalap which formerly existed in our markets, as described by Wood and Bache in the United States' Dispensary, while some of the pieces bear no slight resemblance to the true

root. The specimens I have been able to procure are so imperfect, and so altered by the process of drying, that the botanists I have consulted are unable to give any information even as to the order to which they belong. I have not been able either to trace their commercial history, nor do I know how, under the present able administration of the law for the inspection of drugs, they have obtained admission to our port. The article, or articles, since there are at least two of them, come done up in bales like those of the true jalap, and are probably brought from the same port, Vera Cruz.

No. 1 appears to be the rhizome or underground stem of an exogenous perennial herb, throwing up at one end each year one or more shoots, which, after flowering, die down to the ground. It comes in pieces varying in length from two to five inches, and in thickness from the third of an inch to three inches. In some of the pieces the root has apparently been split or cut lengthwise; in others, particularly in the large pieces, it has been sliced transversely like Colombo root. The pieces are somewhat twisted or contorted, corrugated longitudinally and externally, varying in colour from a yellowish to a dark brown. The transverse sections appear as if the rhizome may have been broken in pieces at nodes from two to four inches distant from each other, and at which the stem was enlarged. Or the same appearance may have been caused by the rhizome having been cut into sections of various lengths; and the resinous juice exuding on the cut surfaces, has hindered them from contracting to the same extent as the intervening part of the root. On the cut or broken surfaces are seen concentric circles of woody fibres, the intervening parenchyma being contracted and depressed. The fresh broken surfaces of these pieces exhibit in a marked manner the concentric layers of woody fibres. The pieces that are cut longitudinally, on the other hand, are heavier than those just described, though their specific gravity is still not near so great as that of genuine jalap. Their fracture is more uniform, of a greyish brown colour, and highly resinous.

This variety of false jalap, when exhausted with alcohol, the tincture thus obtained evaporated, and the residuum washed with water, yielded from $9\frac{1}{2}$ to $15\frac{1}{2}$ per cent. of resin, the average of ten experiments being 13 per cent. Its appearance was strikingly like that of jalap resin. It had a slightly sweetish mucilaginous taste, leaving a little acidity, and the odour was faintly jalapine. It resembled jalap resin in being slowly soluble in concentrated sulphuric acid, but unlike jalap resin it was wholly soluble in ether. In a dose of ten grains it proved feebly purgative, causing only two or three moderate liquid stools. Its operation was unattended with griping or other unpleasant effect, except a slight feeling of nausea felt about half an hour after the extract had been swallowed, and continuing for some time.

This variety of false jalap is possibly used, when ground, for the purpose of mixing with and adulterating the powder of true jalap, or is sold for it, or for the purpose of obtaining from it its resin or extract, which is sold as genuine resin or extract of jalap. The powder strikingly resembles that of true jalap, has a faint odour of jalap, but is destitute, to a great extent, of its flavour. The dust too, arising from it, is much less irritating to the air passages.

The second variety is a tuber possibly of an orchidate plant, a good deal resembling in shape, colour, and size, a butternut (*Juglans cinerea*). Externally it is black, or nearly so, in some places shining as if varnished by some resinous exudation, but generally dull, marked by deep longitudinal cuts extending almost to the centre of the tubers; internally it is yellow or yellowish white, having a somewhat horny fracture, and marked in its transverse sections with dots, as if from sparse, delicate fibres. When first imported the root is comparatively soft, but becomes dry and brittle by keeping. Its odour resembles that of jalap, and its taste is nauseous, sweetish, and mucilaginous.

This root contains no resin whatever. Treated with boiling water it yields a large amount (75 per cent.) of extract. This is soluble, to a great extent, likewise in alcohol. With iodine no blue colour is produced.

The extract obtained from this drug appears, in ordinary doses, perfectly inert, five or ten grains producing, when swallowed, no effect whatever. Is this root employed for the purpose of obtaining its extract, and is this latter sold as genuine extract of jalap?

Of the effect which frauds of this kind cannot fail to have on the practice of medicine it does not fall within my province to speak, but commercially its working is sufficiently obvious. One hundred pounds of jalap at the market price, 60 cents per pound, will cost 60 dols. In extracting this there will be about 5 dols. worth of

alcohol, making in all 65 dols. There will be obtained forty pounds of extract, costing thus 1 dol. 62½ cents per pound.

One hundred pounds of false jalap, No. 1, may be obtained for 20 dols.; admitting the alcohol to cost 5 dols., it will make in all 25 dols. This will produce thirty-six pounds of extract, costing rather less than 70 cents per pound.

One hundred pounds of variety No. 2 may be had for 20 dols., and no alcohol is necessary in obtaining the extract. The yield being seventy-five pounds, the extract will cost rather less than 27 cents per pound.—*N. Y. Journal of Pharmacy*, Jan., 1852.

ON DIGITALIS.

BY GEORGE VON HEES.

ACCORDING to Vogt (*Jahrb. für prakt. Pharm.*, xiv., p. 175) the efficacy of the leaves of digitalis depends on the season when they are gathered. Von Hees, in Barmen, has made the following observations in this respect:—

Nineteen ounces of leaves, gathered in the month of May, yielded three ounces of dry leaves, equal to 15.8 per cent.

114½ ounces, gathered in July, yielded twenty ounces of dry leaves, equal to 17.4 per cent.

ON GUAIAACUM RESIN.

BY L. E. JONAS.

Resin of guaiacum in a powdered state, or in alcoholic solution, becomes, as is well known, under various influences, first green, and then of a beautiful blue; and this colouration appears slowly in the atmosphere, readily by oxidizing agents, but also in a still unexplained manner by many organic substances, particularly by protein substances (*Archiv. der Pharmacie*, Bd. xxv., p. 3—15), in that state in which they are usually found in plants. That part only of the resin which is soluble in ammonia, is said to undergo these changes of colour. (Berzelius *Lehrbuch der Chemie*, Bd. vii., p. 70.)

Among the inorganic substances the following are known to effect these changes:—The atmospheric air, which is here equal to oxygen, although a direct current of oxygen gas has not yet been able to produce it (Schacht), ozon (Schönbein), nitrite of the oxide of ethyle, the chlorides of iron, of quicksilver, of copper, and of gold; and, according to Dr. Schmidt, also hypochlorite of soda.

The latter writer has founded on this fact a method for detecting the adulteration of resin of jalap, and of scammony with resin of guaiacum; he states, that an alkaline solution of such a suspected resin, mixed with a solution of hypochlorite of soda, assumes a green colour, even if only 1/10th part of guaiacum be present.

I have now found that one grain of resin of guaiacum, dissolved in the fourteen thousand parts of spirit of wine, may be detected, and, under certain circumstances, even when in a greater degree of dilution.

It is by the blue and green change of colour that this resin can be detected; but the experiment only succeeds when very clean strips of filtering-paper are impregnated with this diluted alcoholic solution; and immediately, whilst still moist, introduced into the mouth of a glass vessel half filled with chlorine liquor; or the bottom of which is covered with free iodine, without, however, bringing the paper in contact with either of these two substances, in which case no reaction would take place.

The method of detecting the adulteration of certain resins with resin of guaiacum is accordingly very simple, since nothing more is required but to treat an alcoholic solution of the suspected resin in the above stated manner. Under certain circumstances, strips of blotting-paper, impregnated with a solution of resin of guaiacum, are, on the other hand, reagents for detecting the presence of dry vapours of the so called halogen and of nitrous acid in a very sensible manner; for this paper-test is quite indifferent to gaseous hydrochloric acid, sulphuric acid, acetic acid, and formic acid, very probably also to all other oxygen acids that are not ozonized (that yield no oxygen).

All those who have made this interesting change of colour in the resin of guaiacum their study, say, that the alcoholic solution of the resin is changed by chlorine water and by the metallic chlorides enumerated above, from a rather blue, or rather from

a violet colour into a green colour, and, lastly, into a yellowish brown; and that chlorine water colours genuine powdered resin of guaiacum first green, then blue, and, lastly, brown.

According to my observations, these changes of colour are the effects of three stages of oxidation, which, according to all appearance, stand in the closest connexion with these three resins, which are the analytical products of the resin of guaiacum.

Sobrero has studied the resins of guaiacum, after Unverdorben and Jahn, as resin of guaiacum in general, according to the products obtained from them by distillation, and has found them to consist of an oil: guajacyl $C_{10}H_8O_2$, and of an empyreumatic acid $C_{12}H_8O_4$. The property of the alkaline salts of the latter, to become red in the atmosphere, and then, having passed through a number of shades, to change into green, are of interest for the change of colour in the guaiacum and its constitution.

The resin of guaiacum which occurs in brown or yellowish green turbid or confused masses, forms part of the lignum guaiaci; the latter is no chromogen, contains no colouring matter, and forms no lake-colour, when treated with alum or chloride of tin; but its decoction becomes, by continued exposure to the atmosphere, orange-yellow. That portion of the wood, which is soluble in alcohol, and forms part of the resin of guaiacum, is subject to oxidization with changes of colour,—as is usually observed only in inorganic oxides, but which are not peculiar, isolated phenomena, if we consider the ethereal oil of chamomile, oil of cajeput, morphia, quinine, meconic acid, oxide of iron, and many other substances. Oil of chamomile, when getting old, changes its blue colour into green, and at last into a dirty brown. The fresh oil leaves on cotton or linen cloth, after continued exposure to the atmosphere, a green colour, which becomes yellowish brown. The resin of guaiacum is subject to similar oxidization; so that when, in an appropriate solvent, such as ether, alcohol, or oil of turpentine, it comes in contact with certain substances that favour its oxidization, to which its own oxides especially belong, these changes of colour immediately appear.

We find in these products of oxidization, the three primitive prismatic colours: blue, yellow, and red (orange), by the combination of which the green and violet of that resin is produced. A diluted alcoholic solution of the best resin of guaiacum, made without increase of temperature, is colourless with a shade of violet on the inner walls of the vessel. By a shorter or longer exposure to the air, this alcoholic solution becomes darker, and loses the property of producing, with metallic chlorides, the blue reaction. This stage of oxidization having then already passed, whilst certain substances that are in a state of decomposition, or on whose surfaces gases of the halogens, oxygen, or ozon, are condensing, impart to this alcoholic solution of the resin of guaiacum a more or less intense blue colour. Substances containing protein are known to have this effect. I noticed it also in milk, and the surfaces of metals, such as iron and copper.

This stage of blue oxidization is soon followed by one of a yellow colour, which immediately changes the blue into green, until after the completed chemical equilibrium the yellow and brownish yellow colour makes its appearance, which, under common circumstances, cannot be reduced to the blue or green oxidization. Ammonia is one of the substances which effect this.

The yellow product of oxidization can be obtained by itself, if a simple rather reduced solution of the resin is treated with a current of chlorine gas, until the guaiacum is precipitated from its solution of a yellowish orange colour. If only a trace of this oxidized precipitate is mixed with a simple diluted alcoholic solution of the resin (which is the modification of the blue resin, minus water), and, in case the strength of the spirit of wine is above 56 per cent. R., a small quantity of water added, a deep violet or ultramarine colour appears instantaneously, which changes into a splendid blue, and the oxidization having then commenced in the mixture, there gradually follows a green colour, which finally becomes yellowish brown.

The red oxide of the resin of guaiacum which is contained in the foregoing preparation, and produces, with the blue colour in the mixture, the violet, is the result of the continued application of a current of chlorine gas upon an alcoholic solution of the yellow oxidized resin, until the liquid indicates free chlorine, and a precipitate of a solid substance is again formed in it. By the addition of water the perfect precipitation of the orange red resin is effected.

The crystalline precipitates of the resin of guaiacum thus obtained are deprived

of adhering muriatic acid by water. A very colourless mass of the first modification, which appears to be the blue resin, minus water, is obtained by treating an alcoholic solution of the resin with concentrated acetic acid. It corresponds to the *alpha* resin of the resin of guaiacum, and is instantaneously coloured blue by the halogens.

The second product of oxidization is, like the first, readily dissolved by alcoholized spirit of wine, and forms with the metallic chlorides in alcoholic solution, green constant compounds, resinates, *e.g.* with sesquioxide of iron. It is the *beta* resin.

The third product of oxidization, the solution of which is intensely orange yellow, is perfectly soluble in ether and in alcoholized ether only. It is, like the second, characterized by its oxidizing influence upon the *alpha* resin; and forms, with alcoholic solutions of metallic chlorides, green resinates.

Alcoholic solutions of both resins react as sensitively as chlorine and iodine in a liquid state, upon guaiacum in a liquid state, by a fugitive violet and blue colouration, whilst chloride of iron in similar dilution is indicated by it with the same delicacy by a green modification in an alcoholic solution. A paper-test for chlorides of iron, copper, gold, and quicksilver, cannot be formed with their solutions.

The already quoted investigations of Unverdorben, Jahn, Thierry, Trommsdorff, Schacht, Sobrero, and others on lignum guaiaci and resins of guaiacum (*Guajacin*, Thierry, *Annal. de Chem.*, xl., p. 306; *Guajaksäure*, Thierry, *ibid.*, xl., 305; *Guajakholz, falsches*, *Annal. d. Pharm.*, xv., p. 323; *Ueber Guajakharz*, *Journal d. Pharm. et de Chim.*, 1844, p. 116), mention guaiacin and sublimable acids, benzoic and guaiacic acid. They have, however, by no means yet exhausted this field, and do not state what reciprocal relation these substances have to one another with regard to their formation. My own experiments, which I herewith publish, had been originally undertaken for the purpose of studying the interesting phenomena of the colours; but the influence which such strong oxidizing substances as chlorine, iodine, and nitrous acid exercise, induced me to treat the alcoholic solution of the resin of guaiacum with chlorine gas, in the expectation that, during the formation of hydrochloric acid and chloride of ethyle, there would also take place, at the expense of the spirit of wine, an oxidization of the resin of guaiacum, which so readily absorbs the oxygen at the moment of its generation. Schacht says, that this object is not attained by direct application of oxygen; nor can it, according to Jahn, be effected by introducing oxygen through the medium of nitric acid, because the latter produces, even at a moderate temperature, a number of complicated decompositions and combinations. The guaiacum is transformed by it into a reddish yellow mucilaginous granular mass, which is soluble in water, and possesses no oxidizing or colouring influence upon the alcoholic solution of the resin of guaiacum.

In order to become more acquainted with the influence of chlorine gas upon the alcoholic solutions of the resins in general, I acted on a solution of benzoic resin, which so much resembles the resin of guaiacum. As regards the decomposition, the results were nearly the same. Benzoic resin is in this manner decomposed into benzoic acid and a red resin, which can, by alcohol and ether, be separated into two crystallizable resins. The residue thus generated over the red benzoic resin possesses the odour of benzöl. These benzoic resins produce in the oxidized state, and dissolved in ether, no colouration in a similar solution of guaiacum, and therefore are not compounds of chlorine.

I have obtained perfectly similar products and phenomena by the oxidizing influence of chlorate of potash with muriatic acid, upon an alcoholic solution of the resin of guaiacum and benzoic resin. In this case, however, the reaction is too sudden to allow a minute observation of the gradual change.

An alcoholic solution of resin of guaiacum, being poured into a vessel containing an equal volume of diluted muriatic acid of 1.120, a milky liquid is formed, which, the vessel being heated in the water-bath, and the contents stirred with a glass rod, forms a cohering mass, solidifying when cold. Removed from the vessel, and deprived of the adhering muriatic acid by warm water, this substance forms a green, shining, resinous mass, which can be drawn out into fine silk-like threads. The residual muriatic liquid remains slightly clouded, and after some time an intensely green crystallizing sediment forms, with a supernatant liquid, which becomes gradually more and more red, like wine. If the latter be allowed to evaporate spontaneously, a warty crystalline substance deposits. If the evaporation be assisted by heat, a red substance remains behind, after the complete removal of the muriatic acid, which is dissolved in alcohol with a reddish brown colour, and possesses all the properties of guaiacin, as described by Trommsdorff. The same

body is obtained by evaporation from the alcoholic solution of the resin, which has been precipitated by chlorine. It iridizes in all prismatic colours when spread in an amorphous state over a surface.

A similar solution of guaiacum, treated in the same way, with concentrated vinegar, yielded a resin of a yellowish white colour. The residual fluid contains the same body which is produced by muriatic acid, but is here yellowish, and dissolves in alcohol with a violet colour. It possesses in high degree the acrid taste of the resin of guaiacum, and may, therefore, be considered as guaiacin.

Guaiacum resin acid is the product generated by the influence of chlorine upon an alcoholic solution of guaiacum. It is a substance precipitating from its muriatic alcoholic solution in warty orange coloured crystals, insoluble in water, by which it can completely be thrown down from its solutions of a lighter colour. It is readily dissolved by ether and alcoholized spirit of wine; from which solutions it is precipitated with water, entirely unaltered. It melts at a low temperature. When dissolved in spirit of wine or in ether, it loses after some time the capacity of producing the respective colours in the alcoholic solution of common resin of guaiacum. One-quarter of a grain of this substance liquified in a mortar, with a similar quantity of the common powdered resin of guaiacum by spirit of wine, is capable of tinging 100 grs. of powdered sugar of milk intensely blue, if the latter be directly rubbed down with the generated tincture. Its residue of iron colours spirit of wine of a sap-green. Whether this acid forms an ether, I have not yet been able to discover, but it probably does. The liquid obtained from the chlorided alcoholic solution of the residue of the guaiacum yielded a distillate, which developed, after the removal of the chloride of ethyle, the odour of guaiacum in a very agreeable manner, and when exposed to the air, a violet body precipitated from it. The residue of the distillate assumed by muriatic acid a violet colour.

The iridescence and deposition of a violet resinous substance are not peculiar to this distillate, but common to all resins. It takes place chiefly in those cases when resins, dissolved in spirit of wine, are precipitated in the distilling apparatus. After the spirit of wine has been distilled off with the odorous principles of resins, aqueous and alcoholic liquids are obtained, from which turbid and often iridizing violet resins deposit, *e. g.*, in mastic and myrrh. The guaiacum resin acid forms saline compounds with potash and ammonia, soluble in spirit of wine. By the influence of light it becomes gradually decolourized.—*Archiv. d. Pharmacie*, January, 1852 p. 28.

ON THE GUM AMMONIACUM PLANT.

BY F. A. MUSE.

MUSE found the plant which yields the gum ammoniacum in Persia, near the village of Rischm, close to the northern border of the salt-desert, to the south of Damgam, and at the foot of the mountain-chain of Kuni-Nischm, at an elevation of from 3000 to 3500 feet above the level of the sea. He only saw, however, root-leaves and the stems of the previous year. He considers it to be *Dorema Aucheri*, Bois, and not the *Dorema Ammoniacum*, Don. The natives call it *Weschach*, and not, as is usually stated, *Oschak*. The gum resin is gathered by them for commercial purposes. It is not met with in the neighbourhood of Gead, but is said to abound near Tabbas, where it is largely collected. The *Dorema Aucheri* grows in similar places to those in which the *Assafetida* plant is found, on arid rocky declivities, and the stalks attain equal height to those of the latter plant. Frazer's (*Narrative of a Voyage into Kharassan*) states, that the plant occurs also near *Jesellchost*, 5916 feet above the level of the sea.—*Central Blatt*, 1852, No. xiv., p. 223.

THE PHARMACEUTICAL CONVENTION OF 1852 (NEW YORK).

BY EDWARD FARRISH, OF PHILADELPHIA.

HAVING some months since proposed, in the Philadelphia College of Pharmacy, bringing together for mutual advantage and encouragement the scattered elements of what may be called the *nascent* profession of pharmacy, I read with interest the proceedings of the recent Convention of Pharmacologists in New York, calling a National Convention in this city next fall. These proceedings, published in the last

number of this Journal, and so forcibly urged upon the attention of its readers under the editorial head, are worthy to be kept before the pharmaceutical public until the time of the proposed convention; and as the purpose of the present article is to notice some of their details, and to offer some suggestions in relation to them, the resolutions adopted in New York are here inserted.

"Whereas, The advancement of the true interests of the great body of pharmaceutical practitioners in all sections of our country is a subject worthy of earnest consideration; and whereas, Pharmacutists, in their intercourse among themselves, with Physicians and the public, should be governed by a code of ethics calculated to elevate the standard and improve the practice of their art; and whereas, the means of a regular pharmaceutical education should be offered to the rising pharmacutists by the establishment of schools of pharmacy in suitable locations; and whereas, it is greatly to be desired that the united action of the profession should be directed to the accomplishment of these objects; therefore,

"Resolved, That in the opinion of this convention much good will result from a more extended intercourse between the Pharmacutists of the several sections of the Union, by which their customs and practice may be assimilated; that Pharmacutists would promote their individual interests, and advance their professional standing, by forming associations for mutual protection, and the education of their assistants when such association have become sufficiently matured; and that, in view of these important ends, it is further

"Resolved, That a Convention be called, consisting of three delegates each, from incorporated and unincorporated pharmaceutical societies, to meet at Philadelphia on the first Wednesday in October, 1852, when all the important questions beazong on the profession may be considered, and measures adopted for the organization of a National Association, to meet every year."

The plan of organization here proposed is perhaps the best that could have been adopted, under all the circumstances; and yet I confess to some regrets that no-way is opened by which all Pharmacutists who feel interested in the elevation of their profession, and the promotion of pharmaceutical reform, could partake in the deliberations of the Convention. If it were designed to legislate for a profession of pharmacy fully organized throughout the country, I could more willingly acquiesce in the policy of requiring of every member a certificate of his appointment as the representation of some local organization. But the actual condition of the drug trade, and the so-called profession of pharmacy, is widely different. It is only in the large cities that they are organized at all.

As far as educated Apothecaries have penetrated in the great west—and in the more Southern States they are isolated, scattered here and there, with very little concert of action, and no definite organization—they are, for the most part, surrounded by ignorance, overrun with quackery, and scattered singly among the legion of empyrics, they have scarcely strength to stem the current which sets so fatally downwards. Now, for the encouragement and strengthening of such the proposed Convention is eminently calculated, and by associating them in Convention with the Apothecaries of New York, Philadelphia, Baltimore, Boston, Cincinnati, and other cities, in which the benefits of association are already more or less fully attained, the strong tie of professional and fraternal interest, already measurably created by a common object and kindred pursuits, may be widened and strengthened, a renewed interest created in our art, and a higher appreciation of its dignity and importance as a branch of medical science.

So strongly have I been impressed with the importance of an active sympathy with and for this class, that I believe much of the usefulness of the proposed Convention depends upon their being represented; and as a Philadelphia Apothecary, speaking to a certain extent, at least, for the profession in this city, I would invite all who feel an interest in the objects of the Convention, to visit our city at the time, whether armed with credentials or coming in the simple character of Pharmacutists, desirous of elevating the standard of their profession.

Though not included in the invitation of the Convention held in New York, they will find a hearty welcome to the Quaker city; and there can be little doubt, that besides being entitled to attend the sittings of the Convention, opportunity will be offered to communicate, officially or otherwise, their views and feelings to it. These remarks are made with no design to cavil at the action of the Convention in New York, which, by the delegate system, has wisely provided against any undue influence on the action of the Convention, arising from local causes. The sole object I have

in view is to encourage some to attend who might impart and derive advantage from the meeting, but who, because they must needs be pioneers in their several localities, and as yet lack the ability to draw together suitable organizations, cannot come as delegates.

I repeat, let all come—there is not so much material in the pharmaceutical ranks, that the Convention can afford to lose the counsels of any who have the cause at heart, and have the ability to promote it.

Besides the isolated class to which I have referred, there are in most of the larger towns throughout the country small numbers of Pharmacutists, some of whom are more or less interested in the progress of their profession, whom it is designed by the Convention in New York to organize into unincorporated societies, to be represented in the National Convention. Upon the carrying out of this plan depends, to a great extent, the national character of the Convention, and to a certain extent its usefulness, and yet it would be a cause of regret if, by precipitous or unadvised action, any of these associations should be so organized as to be incapable of subserving any permanently useful purpose.

It will be obvious at once that much of their future success and influence will depend upon the course taken at the very outset.

Grave and difficult questions, which experience has proved are of the highest importance, must be met, perhaps, at their very first meeting. What shall be the qualifications for membership? Shall the number of members, necessarily small, be diminished by exclusive regulations, or, on the other hand, shall the enlightened and conscientious Apothecary join hands with the ignorant empyric? Shall ill-gotten wealth and undeserved influence in the community weigh against the true qualifications of an educated, honourable, and high-minded Apothecary?

These and numerous other questions of equal import, especially pertaining to a society which is designed to form an integral part of a national organization to "be governed by a code of ethics calculated to elevate the standard and improve the practice" of pharmacy, must be met and settled *a priori*.

Then will come the jealousies that are almost inseparable from trade, and which it is one of the chief objects of the proposed organization to break up. At the very commencement of any pharmaceutical association, some ground of intercourse must be agreed upon among the members, which, while it shall allow free scope to an honourable and manly competition, shall destroy every germ of this pestiferous plant.

Under such circumstances, will it not occur to every Pharmacist that great caution should be observed in the preliminary steps, looking to permanent local organizations, and that they should not be consummated till after the proposed Convention?

The delegates to such Convention will probably return home with a knowledge of the mode in which the oldest and most successful existing organizations are founded—with a just appreciation of the ethical relations which the members bear to each other, and to the medical profession—of the received opinions in regard to quackery, open and disguised—of the duties and responsibilities of Druggists and Apothecaries in regard to the education of candidates for the profession placed under their care—of the difficulties in the way of giving them such an education, and the best means of overcoming them, and with such enlightened views of the duty and destiny of the profession at large as would enable them to organize, on a sure foundation, auxiliary associations which would be permanently useful in promoting the great objects of Pharmaceutical reform.—*American Journal of Pharmacy*.

CONVENTION OF 1852.—WHAT STEPS HAVE BEEN TAKEN?

NEARLY six months have passed since the meeting of the New York Convention in October last; six months more will bring us to the period of the proposed gathering, and it is entirely proper to put the query—*What has been done to promote the object in view?* We are not disposed to believe that, with the most favourable happening, an instantaneous change can be wrought in the condition of our professional ranks; but we are prepared to avow the opinion that the character and actions of the ensuing Convention, small though it may be, will very much influence the future movements arising from them, and that delegates should be chosen whose experience, ability, and disinterested sympathy for the profession, will induce them to place their best powers at the service of the Convention.

The important questions for deliberation are not personal; individual honours and love of popularity are too apt on such occasions to obtrude themselves into the foreground; but they are such as these:—1. By what means can the existing large number of ill-qualified practising Pharmacutists, everywhere over our country, be induced to improve themselves in education, or in the ability to give better service in their several spheres of action, without omitting their present duties? 2. What are the most efficient and best adapted means by which our apprentices—the Pharmacutists of the future—can receive the benefits of Pharmaceutical education? 3. How far will the principle of association enable the better qualified to extend assistance to the deficient? 4. What means are best calculated to sever the existing connection between Pharmacy and quackery, and to induce Apothecaries to repudiate the sale of secret remedies? And, lastly, what suggestions can be offered to the Convention, by which it may hold out inducements sufficient to engage and direct the latent talent of our ranks, to such useful and interesting scientific objects as shall redound to the improvement of our profession at home, and its reputation abroad?

These are a few of the questions which will naturally present themselves before the earnest delegate, and to the solution of which he will bring his best exertions. The above communication will be read with interest; it is an indication that the subject is engaging attention. Our columns are open to all who desire to be heard, and we would invite our brethren at a distance to use them if they have aught to suggest or to inquire.—*American Journal of Pharmacy.*

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK.

The following communication from the College of Pharmacy of New York was received and read.

To the Philadelphia College of Pharmacy.

New York, Sept. 9th, 1851.

Gentlemen,—Herewith we have the honour of submitting to you a copy of the preamble and resolutions, adopted at a stated meeting of the Board of Trustees on the 4th instant.

Our College has, upon several occasions during the past year, had under consideration the subject of established and uniform standards for imported drugs and medicines, by which their admission should be regulated alike at all the ports of the United States. It is evident, that the important law to prevent the importation of adulterated drugs and medicines, cannot exert its full salutary effect, unless the best practicable standards of quality are fixed, uniformly demanded, and generally understood.

With the hope of promoting this desired improvement, our College, last spring, made a proposition to the other Colleges of Pharmacy, to meet in convention at New York to consult on the matter, with the object, at that time, of laying such propositions as might be agreed upon, before the National Medical Convention of Charleston. The notice was short, however; and though we received interesting communications from Philadelphia, Baltimore, and Boston, yet no delegates from other cities attended. A report, presented by our delegates, was submitted to the National Convention. The proposed establishment of standards was there fully approved; and it was the opinion of that body, that the subject was fitly the province of the pharmaceutical profession.

Since that time, notices more or less favourable to a Convention of the Colleges in the fall, have appeared in several quarters. As the proposal first emanated from New York, it seems, by general consent, to have been left to New York for renewal. In regard to time and place, we have been governed by most of the suggestions we have received from those interested in other quarters. We shall be pleased to hear whether they are acceptable to you, and that we may expect the pleasure of meeting you, and the benefit of your suggestions—the results of your judgment and experience.

The Committee propose that the Convention should meet at five o'clock, P.M. (Wednesday, 15th of October), at the College rooms, No. 511, Broadway.

Please address,

Yours, very respectfully,

GEO. D. COGGESHALL, 809, Broadway.

On motion, the letter and resolutions of the New York College of Pharmacy were directed to be entered on the minutes. The merits of the propositions contained

therein were fully discussed, and it was thereupon resolved to appoint three delegates to meet the proposed Convention in New York, with power to fill vacancies. Charles Ellis, William Procter, jun., and Alfred B. Taylor, were accordingly appointed.

PHARMACY IN RICHMOND, VIRGINIA.

We learn from the *Stethoscope*, that all but two of the Druggists and Apothecaries of Richmond, have agreed to subscribe to the code of ethics promulgated by the Richmond Medical Society—which code closely resembles that of the Philadelphia College of Pharmacy. We hail this as the beginning of a new order of things in the Virginian metropolis, and hope that steps will be taken to form a Society of Apothecaries before the meeting of the Convention in October. A number of young gentlemen from Virginia have graduated at our College with marked credit, and it will not be surprising if ere many years, some of the staunchest columns of our Professional Edifice should arise from the cities of the Old Dominion.—*American Journal of Pharmacy*.

PHARMACY IN LOUISVILLE.

LOUISVILLE is one of the medical and pharmaceutical centres of the Great West. We are informed that the Druggists and Apothecaries of that city are on the eve of forming an association, also that the condition of the practice of Pharmacy has very much advanced within a few years. To our brethren of Louisville, as to those of every American city, where associations do not exist, we would say:—INSTITUTE A SOCIETY; the amount of private interests that will have to be surrendered, will not amount to a tythe of the benefits accruing to the members when such associations acquire solidity by a few years' experience.—*American Journal of Pharmacy*.

MEDICINE AND PHARMACY IN BRAZIL.

In the entire Brazilian empire, there are two national faculties of medicine, termed *Escola Imperial de Medicina*, one established at Rio de Janeiro, the other at Bahia—the present and former capitals of Brazil. Both are constituted exactly alike in laws, forms, number of professors, modelled, with very trifling difference, after the constitution of the *Ecole de Médecine* of Paris. Each college consists of fourteen professors, and six substitute professors, with a director and a vice-director, answering to our own dean and vice-dean of the faculty. The latter are named by Government, from a triple list sent up by the professors every third year, and discharge the ordinary duties of their chairs, being only exempt from attending the examinations. They possess a limited controlling power over their college, and constitute the official channel of communication with Government and public bodies, on all matters relating to public health, prisons, &c. The duties of professor-substitute are explained in the name. When illness, or public employment—the latter not unusual in Brazil—interferes with the duties of the professor, his chair is supplied by the substitute: both are appointed, as in France, by *concours*. Most of the older members have graduated in Portugal, Scotland, France, or Italy. Both classes receive a fixed income from the State, and derive no emolument whatever from pupils and examination fees, &c., which are applied to public purposes connected with the college. The income of the professor was fixed at twelve hundred *mil-reis* per annum—(about three hundred pounds) when first established; and that of the professor-substitute at eight hundred *mil-reis*. Both enjoy the right of retirement on their full salary, after twenty year's service, or when incapacitated by age or infirmities. A travelling professor is elected by *concours* by the faculty, every four years, for the purpose of investigating, in the different countries of Europe, the latest improvements and discoveries in medicine and the collateral sciences, an account of which he regularly transmits, in formal reports, to his college. His expenses are defrayed by the State.

The medical faculty consists of the following chairs:—1, physics; 2, botany; 3, chemistry; 4, anatomy; 5, physiology; 6, external pathology; 7, internal pathology; 8, *materia medica*; 9, hygiene; 10, legal medicine; 11, operations; 12, midwifery; 13, clinical medicine; 14, clinical surgery.

In addition to the professors, there is a secretary (medical), treasurer, librarian, and chemical assistant—all elected by the faculty.

The order of study is as follows:—first year, medical physics and medical botany; second year, chemistry and general and descriptive anatomy; third year, anatomy and physiology; fourth year, external pathology, internal pathology, pharmacy, and *materia medica*; fifth year, operative medicine and midwifery; sixth year, hygiene, history of medicine, and legal medicine.

All examinations are public, and the subjects are drawn by lot.

The titles conferred by the faculty are only three, viz., Doctor in Medicine, Apothecary, and Midwife. The latter is specially educated and examined.

In each chief city there are commonly three or four large hospitals—the *Mizericordia*, or Civil Hospital, possessed of ample funds from endowments, legacies, and certain taxes; the Military and Naval Hospitals; and, in Rio, Bahia, and Pernambuco, Leper Hospitals. There are also infirmaries attached to convents. Private subscriptions to institutions are utterly unknown.

The academical session lasts for eight months—from 1st March to 30th October—lectures being delivered daily (with some exceptions) by the professors or their substitutes. The professors of clinical medicine and surgery have the right of selecting their cases from the *Mizericordia* Hospital.

The student, previous to matriculation, must take his degree in arts; and the curriculum is the same for all, viz., six years to obtain the degree of Doctor in Medicine. The examinations are conducted as in Paris. For the degree of Doctor in Surgery—which, however, is not essential—a subsequent and special examination must be undergone, as in France.

All students are classified, on entering college, into *medical* and *pharmaceutical*; and both are obliged to obtain the degree in arts before they can be matriculated, and to have completed their sixteenth year. The pharmaceutical student obtains his diploma of pharmacy after three years' study; while that of medicine can only be obtained after six years. The student of pharmacy is obliged to repeat the courses of medical physics, botany, chemistry, pharmacy, and *materia medica*; while one course only of each is required from the medical pupil. The pharmaceutical student is obliged to attend for three years in a pharmacy, after the conclusion of his academical studies. He then undergoes an examination by the faculty, and publicly defends a thesis to obtain his diploma. His duty afterwards, as Apothecary, is strictly limited to the sale of drugs, and the compounding of prescriptions. He is never consulted professionally; and, did he attempt to apply a remedy for the cure of any disease, he would be immediately fined fifty *mil-reis* by the municipality, for the first, and an increasing fine for every subsequent offence; and, did he still persist, his licence would be withdrawn. On the other hand, the medical practitioner is strictly prohibited from the compounding or sale of medicines, in any shape or form.—*Dundas's Sketches of Brazil.*

CHEMICAL SOCIETY.

March 15th, 1852.

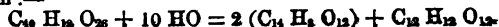
PROFESSOR DAUBENY, PRESIDENT, IN THE CHAIR.

CONTRIBUTIONS TOWARDS THE HISTORY OF TANNIC ACID.

BY DR. STRECKER.

Communicated by Dr. Hofmann.

THE author states he has ascertained that tannin, when acted on by acids, yields sugar in addition to gallic acid, so that, henceforth, tannic acid may be classed with the conjugated sugar compounds. If tannic acid be thrown down from a pure solution with sulphuric acid, the precipitate boiled with water or very dilute sulphuric acid, the solution neutralized with carbonate of lead, the gallic acid now present, precipitated with acetate of lead, and the excess of this precipitant removed by sulphuretted hydrogen, the liquor, on being evaporated, will yield a syrupy residue possessing all the properties of sugar modified by acids. The author states that he has not yet determined the quantity of sugar that is produced by a known weight of tannic acid, but suggests that the composition of tannic acid will probably have to be represented by the formula ($C_{40} H_{18} O_{26}$); and the transformation which tannic acid undergoes under the circumstances alluded to, would then be shown by the following equation:—



April 5th, 1852.

COL. PHILIP YORKE, VICE-PRESIDENT, IN THE CHAIR.

ON THE DETECTION AND QUALITATIVE SEPARATION OF TIN, ANTIMONY,
AND ARSENIC,

And on the Relation existing between these Metals and others which are precipitated from their acid solutions by Sulphuretted Hydrogen.

BY CHARLES L. BLOXAM.

AFTER a few prefatory remarks, and a review of the principal methods hitherto proposed for effecting the object in view, the author proceeded to describe the method which he has been led to adopt, which consists in treating the precipitated sulphides of arsenic, antimony, and tin, with solution of sesquicarbonate of ammonia, which dissolves the sulphide of arsenic, and part of the sulphide of tin; the arsenic is detected in the precipitate, thrown down from the solution by hydrochloric acid, by the test of Fresenius and Babo, whilst the tin is sought for in another portion of the same precipitate, by deflagrating it with nitre, precipitating the aqueous solution of the fused mass with nitric acid, reducing the tin from the precipitate by fusion with cyanide of potassium, treating the reduced metal with hydrochloric acid, and testing the solution for protochloride of tin with perchloride of mercury. Antimony and tin are detected in the precipitate left undissolved by sesquicarbonate of ammonia; this precipitate is dissolved in nitro-hydrochloric acid, and the solution boiled with excess of sesquicarbonate of ammonia, when the whole of the tin is precipitated, and part of the antimony remains in solution; the tin may be discovered by reducing the precipitate as above described, and the antimony may be precipitated as sulphide by acidulating the solution with hydrochloric acid, and passing sulphuretted hydrogen.

Some curious facts were stated respecting the insolubility of bisulphide of tin in sulphide of ammonium, in the presence of sulphides of copper and tin. Methods were described, by which these difficulties may be overcome.

All the processes mentioned in the paper were verified by experiments upon mixtures containing known quantities of the various metals.

ROTHERHAM COUNTY COURT, *March 26.*

THE APOTHECARIES' COMPANY v. CROWTHER.

THIS case was heard by special jury. Mr. Whitfield appeared for the plaintiffs, and Mr. Fretson for the defendant.

Mr. Whitfield stated that the action was brought to recover the sum of £20 for an infringement of the Apothecaries' Act of 1815, the provisions of which he explained. He cited several cases in which he was prepared to prove that defendant had attended patients, furnished the medicine, and sent in the accounts as an Apothecary. The action was limited to the recovery of one penalty. The principal case was that of Harriet Arch, wife of Charles Arch, railway labourer, who stated, that in November last, she consulted Mr. Crowther in his shop for a pain in her side. He gave her some medicine and charged one shilling. She called on other occasions, and afterwards he visited her at her house. He looked at her tongue, felt her pulse, examined her side with a stethoscope. He ordered leeches and more medicine. She afterwards consulted Dr. Shearman as a gratis patient, and took the prescriptions to be prepared by Mr. Crowther. She was cured after two visits. The delivery of the medicine having been proved, *Dr. C. J. Shearman* was called, and said he saw Mrs. Arch for the first time on the 30th of January. She was suffering from derangement of stomach and liver. Cross-examined. He was not acquainted with Mr. Upton, secretary to the Apothecaries' Society, but had been the indirect means of letters being sent to him. The correspondence was conducted by Dr. Shearman, his father, as president of a Society of Medical Men in Rotherham, which had been established at witness's suggestion about two months. There were nine members. *Mr. Fretson*. Are they all qualified? *His Honour* objected to the question. *Witness*. The Society was formed for the purpose of stopping illegal practice, which was very common in Rotherham, and a great injustice to the public. *Mr. Whitfield* objected. *Mr. Fretson* said the evidence was material, as it showed, that if this offence was very common among the practitioners in Rotherham, defendant's offence was less by comparison. *His Honour* said that might have been the case if the amount of the penalty had been a subject to be determined, but this was fixed. Cross-examination

continued. *Witness* thought half the penalty should go to the medical men at Rotherham. Defendant was selected because his case was the most atrocious. Defendant had been eight years with his (witness's) father as pupil and assistant. *Witness* was present at the meeting of the Society at which it was decided to proceed in this case. The Society was unanimous. *Mr. Fretson*. Was there no difference of opinion? No.—Were not two of them fighting? No, at the time I speak of the Society was unanimous.

Two other cases of a similar nature having been proved,

Mr. Fretson argued for the defence that defendant had not infringed the spirit of the Act, as he was qualified to practise, although not legally so; and that he had not acted illegally, as any person might give friendly advice; and the payment was not for advice but for the medicine. He contended that the case had arisen out of a jealous feeling that defendant was getting some of Dr. Shearman's patients. A letter was put in as evidence addressed to defendant, and signed by Dr. Shearman, stating as follows:—"A form of advertisement may be immediately sent to me, to be approved by the committee, and subsequently inserted at your expense in all the local newspapers of this week, if you wish to prevent a prosecution." Copies of resolutions of the Society were also enclosed, the first pledging themselves to proceed, by every legal means, against irregular practitioners in general; the second resolving that, unless Mr. Crowther should immediately advertise (as above) and totally cease from practice, he should be proceeded against.

Dr. Shearman was called and said, that while defendant was in his employment he was satisfied with his ability and his conduct, but he was deficient in anatomy and physiology, which he (witness) had not the means of teaching him for want of bodies to dissect. He gave him a certificate on leaving, "I hereby certify that Mr. James Crowther has been with me nine years, five as a pupil and four as assistant. He is quite capable of taking any office as assistant, is exceedingly well read and intelligent, and of excellent moral character." *Witness* had offered to lend him £300 to enable him to study and pass his examination.

His Honour in summing up said, the law required that a person acting as an Apothecary should be qualified according to Act of Parliament. No matter how well educated he might be, the question was this, "Is he qualified according to the Act of Parliament?" namely, with an Apothecaries' certificate. If it was his intention to make a profit of his visits to the sick, it was idle to call them friendly visits. The case was not affected by the question whether it had been brought forward with jealous motives.

The jury gave a verdict for the plaintiff.

THE BENEVOLENT FUND.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

DEAR SIR,—One of the popular topics of the present period which engages the attention of the public, is that of the best plan, in the event of an invasion, of arresting the success of the aggressor, and of maintaining the commerce and liberties of the inhabitants of this country inviolate; and as this subject has called forth much that may be of ulterior advantage to us as citizens of this part of the world, I was led to reflect whether as a Society, we occupied just that position which we ought to occupy after so many years from our formation, and whether or not we were secure (not from foreign invasion), but from changes which are incident to corporate bodies, and provided also against them when they should occur.

That excellent arrangement of the Institution, the Benevolent Fund, meets one of these alternations which time and commerce impose on many, and the supplies for it being separate from the General Fund, is no less valuable; it offers at once a test most excellent of the philanthropy and kindly feeling of the Members, and in effect says, "by this shall all men know your principles if you have charity one towards another." The next month will place before us the state of its funds, and these I hope will show, that in that particular respect we have not been unmindful of each other. It occurred to me also, that a separate fund, to be called the Endowment Fund, would not be inapplicable under the circumstances which are now and which may arise. With these monies I would respectfully suggest the purchase of an acre of land, in a healthy locality a few miles from town, and the erection of ten dwellings

for as many decayed members of our profession; these to have such a sum annually for their maintenance as that particular fund would allow, aided by a grant from the general stock when urgent cases were presented. Why the Druggists should not have as other companies these advantages in the decline of life, I am at a loss to find out, for by this outlay the appalling prospect of parochial relief would be averted in ten instances, and the amount also of mental suffering be avoided. This proposal may to some appear a formidable matter to encounter, but the reflection that for one year the simple advance of fifty per cent. on the general subscriptions would purchase the land and erect the buildings, the fearfulness of such an undertaking will speedily disappear. I presume that an acre of land suited for such an object, may be purchased for £200, and that comfortable places for residence may be built for £100 each. I would with deference inquire, what is that amount among so many? and who can tell but that our brethren in the wholesale branch of the profession may not feel a pleasure in subscribing handsomely towards so good a cause, and with satisfaction when pointing out the spot and its accommodations to their friends, say, you perceive that we do more than talk of "kind acts." I have also thought that some of our wealthy friends would feel gratified in leaving a bequest to a charity, so tangible, so Christian, and so capable of yielding in the decline of life the comfort it requires. Excuse this homely complaint:—

"If youth did know what age doth crave,
How many a penny it would save."

A fine opportunity is here presented to our young brethren of coming forward in the cause of benevolence, of exhibiting the development of the "Heart that can feel for another," and thus proving that amidst all the tales of distress which reach us, the young Chemists understand the best definition of sympathy—"Gaudeo cum gaudentibus, et fleo cum flentibus."

Collumpton, April 24, 1852.

Remaining, dear Sir, yours faithfully,
JOSEPH FOSTER.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—An article appears in the current number of the *Pharmaceutical Journal*, entitled "Adulteration of Borax," and calling the attention of the trade to the fact, that a large quantity of phosphate soda had been mixed with the borax sent out by a house in Wolverhampton. As this statement, fixing the transaction upon Wolverhampton, but not specifying the parties themselves who are guilty, may have a tendency to injure ourselves in the estimation of our customers, we are sure you will not refuse us the use of the *Journal* for the purpose of stating that ours is *not* the establishment from which the spurious borax referred to was sent out.

Wolverhampton, April 26, 1852.

We are, Sir, your obedient servants,
W. H. LOWE & SONS.

NOTICES OF BOOKS RECEIVED.

A HAND-BOOK OF ORGANIC CHEMISTRY, being a new and greatly enlarged Edition of the *Outlines of Organic Chemistry*. By WILLIAM GREGORY, M.D., F.R.S.E. Third Edition, corrected and much extended. Taylor, Walton, and Maberly.

GREGORY'S *Outlines of Chemistry*, especially the part relating to the organic department of the science, has justly been considered one of the best of the chemical manuals or class-books for the use of students. Since 1845, when it first appeared, it has passed through two editions, in the second of which it received considerable augmentation, and a further addition of matter being again found necessary, in order to make this, the third edition, a correct and tolerably complete exponent of the existing state of Organic Chemistry, a new and more appropriate title has been adopted. The general arrangement of the work, however, remains unaltered, and the enlargement has been occasioned rather by the notice of new facts and views, than by the extension of such as were contained in former editions. It is not the object of the work to explain minute details, but to give a general view of the results which have been obtained, and of the bearing of these upon the views and theories which are generally received among Chemists. There is no work extant which

accomplishes these objects more efficiently than that before us. The matter has been judiciously selected, the arrangement is good, and the application, which is made of the facts adduced for the explanation of principles, is so remarkably clear, as to bring subjects, often considered intricate and difficult, within the easy comprehension of all classes of students.

HOMŒOPATHY UNVEILED ; or, Observations on Hahnemann, his Doctrines and Treatment of Disease. By WILLIAM PERRIN BRODIE, M.R.C.S., &c. Second Edition. (2 copies). London : S. Highley, Fleet Street, 1852.

This is one of the best written and convincing expositions we have seen of the doctrines and practice of Homœopathy.

"Convince a man against his will,
He holds the same opinion still."

But those who desire to arrive at the truth, and who have not previously given much attention to the subject, will find in this pamphlet a clear solution of the mysteries of the theory of atomic doses.

DENTAL SURGERY AND MECHANISM ; a Popular Treatise on the Management and Surgical Treatment of the Teeth and Gums, &c. &c. By EDWARD LUKY. London : G. Mann, Cornhill, 1846.

RETROSPECT OF MATERIA MEDICA AND PHARMACY FOR THE YEARS 1846 & 1847. By RICHARD AUSTIN, M.D., &c. &c. Dublin : Hodges and Smith, Grafton Street, 1848.

CANADA MEDICAL JOURNAL, and Monthly Record of Medical and Surgical Science. Edited by R. L. MACDONNELL, M.D., and A. H. DAVID, M.D. Vol. I., No. 1. Montreal : John Lovell, 1852.

NEUES REPERTORIUM FÜR PHARMACIE. Band I., Heft 1 and 2. Dr. A. Buchner, Sen. München : Buckhandlung von Christian Kaiser, 1852.

VALEDICTORY ADDRESS TO THE GRADUATES OF THE PHILADELPHIA COLLEGE OF PHARMACY, Delivered in Sanson Street Hall, March 18, 1852. By WILLIAM PROCTER, JUN. Philadelphia : Merrihew and Thompson, 1852.

TO CORRESPONDENTS.

Enquirer.—The strength of test acids used for alkalimetical purposes, should be determined by direct experiment, using pure carbonate of soda obtained by heating the bicarbonate. Calculations made from tables, such as that referred to, would not be satisfactory.

Pixides.—(1.) A tin canister is not a proper thing to keep tartaric acid in.—(2.) For the method of getting good crystals, see vol. x., page 536 of this Journal.

X. F.—The microscope offers the best means of detecting the adulteration of the flour of mustard.

J. H. S.—Pills very rarely admit of being analyzed.

H. N.—No.

A. K. D.—(1.) For red prussiate of potash, see any work on Chemistry.—(2.) Fousel oil, which is impure hydrated oxide of amyle, may be obtained of the distillers and rectifiers of spirits.

Registered Apprentice.—(1.) The platinum plate should be equal, or nearly so, to the surfaces of zinc presented to it, in order to get the full effect of which the battery is susceptible.—(2.) No.

R. A. P. S.—There is no such work.

A. Z.—The result stated does not accord with our experience.

F. G.—(1.) See vol. v., pages 288 and 384 of this Journal.—(2.) Druggists, who were in business on their own account at the date of the Charter of the Society, February 18th, 1843, may be admitted into the Society without examination, on payment of an entrance fee.

R. F. (Bristol).—The introduction of such a clause would be impracticable.

A Constant Reader.—The work alluded to was *Robinson on the Teeth*, not *Robertson*; and is published by Webster, Piccadilly, 1846, price 10s.

C.E.R.—Phillips's *Translation of the Pharmacopœia*.

An Aspirant.—(1). Balfour's *Manual of Botany*, price 12s. 6d.—(2). Fownes's *Manual of Chemistry*, price 12s. 6d.

E. W. (Hastings).—In the reference to the article on Aloin, in the *Monthly Journal of Medical Science*, the date should have been February, 1851.

αλθα.—Benzole is sold by Halliday on Holborn Hill. It is one of the constituents of coal tar naphtha, from which it is obtained by fractional distillation.

W. H. Tessier, R.A.P.S.—We do not recommend works on Anatomy, Physiology, and Astrology, but advise our correspondent to apply at some medical school.

An Apprentice.—Concentrated milk is made by mixing sugar with milk, and submitting it to slow evaporation.

W. Densem.—Stills of less capacity than two gallons, are exempt from licence, under the Spirit Licence Act.

A.B.C.D.—Grease.

J. R. L.—The Daguerreotype process is now very generally practised without a licence. The apparatus required may be had of Knight and Sons, Foster Lane. The price of a complete set would be about £15, that of the camera alone, £2 2s.

Amator Justitiæ should communicate with the Secretary.

Exeter.—The specimen has been received.

W. J. B.—(1). Application should be made to the Board of Examiners.—(2). Probably six months.—(3). Some proficiency in the subjects mentioned would be required.

J. N. has directed our attention to an Advertisement in the *News of the World*, which is as follows:—

"TOOTH-ACHE EFFECTUALLY CURED.—A receipt is now offered to the public at a mere nominal price, it costs but one penny in preparation, is easy of application, and a certain cure for this distressing malady. Chemists and Druggists would do well to obtain it, as they would find for it a ready sale as Tooth Tincture. The recipe and directions for applying it will be forwarded, by enclosing a stamped and directed envelope with three postage stamps, to Mr. Newton, Chemist, Wiveliscombe. Please copy the address, as this advertisement will not be repeated."

The following is the recipe:—

Tincture Myrrh, 6 drops.

Friar's Balsam, 12 drops.

Spirit of Salts, 18 drops. Mix.

Put a bit of lint on the point of a needle, dip it in the mixture, and lay it in the hole of the tooth.

J. N. has also sent a Bill-head, of which the following is a copy:—

"Bought of T. Newton, jun., Ironmonger, Cutler, Brazier, and Tinman.—Articles repaired at the shortest notice.—Dealer in China, Glass, and Staffordshire Ware.—Old Metals and Horse-hair bought or taken in exchange."

J. N. informs us that the two documents emanate from the same person.

Chemicus (York) furnishes a parallel example of an interesting addition to the body of Dispensing Chemists, but he has not authenticated it with his name, consequently the statement is of no value.

W. B. (Oldham) alludes to the practice adopted by the vendors of quack medicines, of sending persons to order the same, and not calling again, by which means the article is purchased and left on the hands of the Chemist. He gives an instance in which he has become the proprietor, against his will, of a bottle of Simpson's West Indian Fluid.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, Secretary, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho. Other communications to the Editor.

THE PHARMACEUTICAL JOURNAL.

VOL. XI.—No. XII.—JUNE 1st, 1852.

THE PHARMACY BILL,

AS AMENDED BY THE SELECT COMMITTEE.

IN Parliamentary language alterations are termed *amendments*; but it does not follow of necessity that a Bill which is "amended" is improved. In the case of the Pharmacy Bill the reverse is the fact; but in the present state of a moribund Parliament it would be impolicy to attempt to drive a bargain, or to raise a discussion with a view of obtaining any further concessions than those to which the select committee have assented. To pause is to be undone, and the choice is between the Bill as amended, and no Bill at all. If any objectionable provisions had been introduced the question might have been one requiring very serious consideration; but this is not the case. The Bill, although diluted, is not destroyed. It will not effect all that was desired, but its tendency is in the right direction. In consequence of the alterations made in the Bill, the opposition of the medical bodies in Scotland is withdrawn; and the objections which were raised in the House at the time of the second reading are met.

THE METROPOLITAN BURIAL BILL.

THIS Bill, which has been brought in by the Government, and has passed the second reading, affords a prospect of providing an effectual remedy against the evils of intramural interment. We have on former occasions alluded to this subject in its relation to sanitary reform, and have noticed the visionary and impracticable schemes which have been proposed for the avowed purpose of removing the existing abuses. These schemes have been sufficiently exposed and abandoned. The present Bill repeals the Metropolitan Interment Act, and provides for the closing of over-crowded or otherwise objectionable burying grounds, after due notice, by an Order in Council, and for the purchase or construction of other burial grounds, or portions of cemeteries by parish authorities, under the sanction of the Secretary of State. The management of the burial grounds will continue in the vestries or other boards as heretofore.

By the provisions of the Bill existing rights and privileges are protected, and the public will be secured against the nuisance of intramural interment, without any officious interference on the part of the Board of Health. This Bill is one of the necessary measures which ought to be carried during the present Parliament.

THE STRYCHNIA PANIC.

If the report of Professors Graham and Hofmann, in our last number, respecting the supposed adulteration of bitter beer with strychnine, had required confirmation, this is to be found in a paper in the *Lancet* of May the 15th. This paper contains analyses of the water used by Messrs. Bass and Co., with the report of the examination of twenty samples of their bitter beer, and similar analyses and report of the water and bitter beer of Messrs. Allsop and Co. It is indeed surprising that a rumour so visionary should have obtained credence in this or any other country. Until the statement found its way into the *Times* newspaper, it was either unobserved or disregarded as unworthy of notice by those who have subsequently found it necessary to allay the disquietude of their customers, by the publication of an unqualified contradiction, supported by chemical and other evidence. Soon after the promulgation of the rumour, Messrs. Bass and Co. and Messrs. Allsop and Co. invited the public to inspect their establishments, and every facility was afforded for the most searching investigation. However superfluous this may have been, considering the absurd nature of the allegation, yet it gave those who were interested in the subject an opportunity of witnessing the mode in which the process of brewing is conducted in these gigantic establishments, and drawing their own conclusions respecting the sanitary qualities of a beverage for which the demand is so extensive. The supposition that this beverage contains a deadly poison in such proportions that half a gallon or a gallon would destroy life, is purely ridiculous, and the statistical calculation of the quantity of strychnia which would be required for the purpose is a sufficient proof of the absurdity of the supposition. But to many persons ocular demonstration is the most satisfactory evidence. We remember the case of a Physician who insinuated to a Chemist that his syrup of poppies was made with treacle and laudanum. The Chemist indignantly denied the aspersion and produced his laboratory receipt-book, but could not succeed in overcoming the suspicion. The next time he prepared syrup of poppies he requested the Physician to call and see the process. The capsules were in maceration, and a portion of the liquor was in the evaporating-pan. This, however, was not sufficient, but another visit at the time the sugar was added completed the proof that the ingredients employed were poppy capsules and sugar—not laudanum and treacle. The strychnia panic affords an example of the mischief which may result from the circulation of an idle rumour. The circumstance that a large quantity of strychnia had been sent from France to England, led to a variety of speculations as to the purpose to which it was to be applied, and the surmise of a French writer, that it might be applicable to bitter beer, led to the inference that all the bitter beer in this country was contaminated with the poison. It was afterwards reported that the strychnia was used for poisoning wild animals by collectors of skins for the furriers. It was said that arsenic, which is sometimes used for that purpose, injures the skins. Both these notions we have ascertained to be unfounded, as we are informed, by several wholesale furriers, that they have never heard of strychnia being so employed unless by way of experiment, and that arsenic does not injure the skins, but is often used in dressing them. The "large importation" of strychnia appears to have been only about fifty ounces, while not less than 30,000 ounces would have been required to contaminate the quantity of bitter beer annually made in this country. On the strength of these absurd speculative rumours two highly respectable firms have been subjected to much annoyance and considerable expense, and the public have been distracted with apprehension respecting the supposed deleterious qualities of a fashionable beverage. The bubble having burst, the discussion has served as an excellent advertisement for Messrs. Bass and Allsop.

TRANSACTIONS OF THE PHARMACEUTICAL SOCIETY.

ELEVENTH ANNIVERSARY,

Held at 17, Bloomsbury Square, Tuesday, May 18, 1852.

Mr. THOMAS HERRING, President, in the Chair.

THE PRESIDENT reminded the Members that they had arrived at the eleventh anniversary of the Society, and he trusted that their exertions would ultimately be attended with that success which they desired, namely, the improvement in the education and position of the Chemists and Druggists generally. Before calling on the Secretary to read the Report, he felt it to be his duty to offer a few observations on the loss which the Society had sustained during the past year, by the decease of their valued Treasurer, Mr. Pigeon. A short memoir of Mr. Pigeon had appeared in the Pharmaceutical Journal, which he could, from personal knowledge, testify to be a faithful account of a great and good man. He had enjoyed his friendship for many years, and had always looked up to him as an example. Although Mr. Pigeon did not aspire to the higher walks of science, he was a sincere and zealous advocate of improvement and education. He was always ready to come forward in aid of a useful undertaking; in the establishment of the Pharmaceutical Society his services had been most valuable, and he had continued to be one of its most able supporters as long as his health enabled him to take an active part in its proceedings. One peculiar merit in Mr. Pigeon was the skill with which he "poured oil upon the troubled waters," and smoothed over any difficulties occasionally arising from differences of opinion among the Members of the Society, or any other persons with whom he was associated. He considered the decease of Mr. Pigeon a great public loss.

The President then called upon the Secretary to read the

REPORT OF THE COUNCIL.

FINANCIAL REPORT.—RECEIPTS AND EXPENDITURE,

From January 1st to December 31st, 1851.

<i>Dr.</i>	<i>£ s. d.</i>	<i>Cr.</i>	<i>£ s. d.</i>
Life Members' Subscriptions	42 0 0	Balance, January 1st	113 19 7
Interest	21 3 2	Benevolent Fund, Investment.....	151 11 6
	63 3 2	Gratuities.....	46 0 0
Benevolent Fund, Subscriptions	71 18 6		197 11 6
Interest	115 2 0	Furniture.....	9 3 2
	187 0 6	Fixtures and Fittings	3 6 6
Government Securities, Interest ...	127 9 8	Sundries	1 8 0
278 Town Members' Subscriptions	437 17 0	House Expenses	40 17 9
1149 Country Members.....	1206 9 0	Rent, Rates, and Taxes	396 9 0
8 Entrance Fees	16 16 0	Postage	40 16 11
332 Associates.....	205 16 0	Stationery.....	8 5 11
15 Examination Fines	15 15 0	Printing Bye-Laws, &c.	72 16 3
350 Registered Apprentices	173 5 0	Commission	36 12 3
Registration Fees	22 1 0	Board of Examiners.....	37 16 0
Arrears of Subscriptions	47 15 6	Travelling Expenses, Country Mem- bers of Council	38 15 3
Lecture Fees	18 7 6	Law Charges	16 8 4
Laboratory Fees	639 9 0	Wages	125 5 0
Balance	386 17 4	Salaries	305 0 0
		Journals	561 3 9
		Delivery of Journals	151 4 0
		Library	75 8 8
		Museum	132 10 5
		Lectures	483 14 9
		Laboratory, Professor.....	319 14 6
		Expenditure	354 19 8
			674 14 2
	£3547 2 2		£3547 2 2

WE, the undersigned Auditors, have examined the Accounts of the PHARMACEUTICAL SOCIETY, and find them correct, agreeably with the foregoing Statement; and that there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1851,

	£	s.	d.
On Account of the General Fund.....3½ per Cents. Reduced	3000	0	0
New 3½ per Cents.....	1036	7	1
Benevolent Fund 3 per Cent. Consols ...	4106	2	7
Life Members' Fund 3 per Cent. Consols ...	726	11	0

BENJAMIN HUMPAGE.
GEORGE REYNOLDS.
CHARLES McCULLOCH.

April 16th, 1852.

LABORATORY.

Seventh Session.—From October 1st, 1850, to July 31st, 1851.

	£	s.	d.		£	s.	d.
Fees received from Thirty-				Professor's Fee *	339	13	6
seven Pupils	679	7	0	Assistant and Wages	75	8	0
Balance	41	14	8	Apparatus, Drugs, Chemicals, and Sundries.....	257	16	2
				Gas, Coal, and Coke	48	4	0
	<u>£721</u>	<u>1</u>	<u>8</u>		<u>£721</u>	<u>1</u>	<u>8</u>

THE SCHOOL OF PHARMACY.

IN accordance with the recommendation contained in the Report presented at the last Anniversary by their predecessors, the Council have devoted considerable attention to the financial position of the School of Pharmacy. They have not thought it expedient, during the past year, to curtail or alter the course of instruction. Taking into consideration the importance of the object for which the School was founded, and the comparatively small amount of the fees received from the Students for admission to the Lectures, it was thought advisable, during the session 1851-2, to remit the fees to Members and Associates of the Society with a view of promoting a numerous attendance, and thus at the same time extending the advantages of the School and the interest in the education which it affords.

It was stated in the last Report that, in the absence of a compulsory examination creating a general demand for education, a School of Pharmacy must of necessity be attended with a heavy expense. In order to form a correct opinion as to the policy of incurring this outlay, and the propriety of curtailing the amount, it is necessary to revert to the circumstances under which the School of Pharmacy was founded, the object for which it was designed, and the result which has attended the undertaking.

The School was originally established for the purpose of introducing a systematic plan of Pharmaceutical education, and affording to Students the most approved and effectual means of preparing for examination. It was founded on the principles adopted in Continental schools, comprising lectures and practical instruction, with the advantage of a Library and Museum for reference. The charter of incorporation neither provided for nor prohibited the maintenance of a School of Pharmacy. The charter describes the Society to be an association formed "for the purpose of advancing Chemistry and Pharmacy, and promoting a uniform system of education of those who shall practise the same," &c. The mode in which this should be effected is not defined, but powers are given to the Council "by themselves, or such competent persons as they may think fit to appoint," to examine the future Members, Associates, and Apprentices or Stu-

* Out of this sum the Professor pays about £180 to Assistants.

dents, and "to grant such certificates or diplomas as they shall think proper." If Schools of Pharmacy had previously existed in this country affording the requisite facilities to students for qualifying themselves, the Society would have effected its object by the examination of the candidates, and would have indirectly regulated the education by defining the nature and extent of the qualifications required. But in the absence of any such schools or means of systematic education, a Board of Examiners, having no compulsory powers, could have effected little or no improvement, as they would have been obliged either to reduce the qualification to a very low standard, or to reject a great majority of the candidates, and thus to deter others from submitting to the ordeal. It is obvious that, in this way, the objects of the Society as an association for advancing Chemistry and Pharmacy, and promoting a uniform system of education, would have been frustrated. A School of Pharmacy was, therefore, necessary, and as this formed a part of the establishment of a corporate body designed ultimately to represent British Pharmacy, it was necessary that the arrangements should be on a scale commensurate with such object, and consistent with the character of such corporate body. It was the desire of the founders to make the School a model School of Pharmacy, complete in all the requirements for theoretical and practical instruction. This was held to be the primary consideration; to this end the attention of the Council was chiefly directed, and the Society is in possession of evidence showing the efficacy of the system. But in a pecuniary sense the result has not realised the anticipations of its promoters; for, although it was never supposed that a school of this kind could be self-supporting in the absence of any law requiring a qualification in the class of persons for whose benefit it was intended, yet it was not expected that the number of Students would have been so small, and the consequent burthen on the funds of the Society so great, as experience has proved to be the case. Viewing the question in connection with the other proceedings of the Society—as a part of a great undertaking—it becomes necessary to consider whether the advantage derived from the School is an equivalent for the pecuniary sacrifice, or whether it be advisable to reduce the scale on which the School is conducted for the purpose of limiting the expense. It must be remembered that the School of Pharmacy in Bloomsbury Square is the only one in this kingdom which comprises all the branches of instruction required by the Pharmaceutical Chemist; and, although several Schools of Chemistry have been established within the last ten years, they embrace a wider range of Analytical and Agricultural Chemistry than the Pharmaceutist requires, and do not extend to *Materia Medica* or Botany.

The Council are of opinion that the experiment undertaken by the Pharmaceutical Society has had a fair trial. It will be the duty of the next Council to consider in what manner retrenchment may be effected under the circumstances above detailed.

THE EXAMINATIONS.

THE Council are glad to observe, that the number of candidates for examination is gradually increasing. At the same time, it must be confessed that the total number is not sufficient to justify the hope that a voluntary examination will be generally resorted to by those who embark in business as Chemists and Druggists. There are a few young men who appreciate the advantages of a proper qualification, and aspire to the distinction which a Certificate of Examination from a voluntary Society affords, but the majority will always avail themselves of the latitude allowed by the law, and escape an ordeal entailing upon them a certain amount of labour and inconvenience, and conferring no privilege sufficiently tangible to rouse their energy. The following table of the number of Examinations from the year 1843 to April, 1852, inclusive, will tend to corroborate this statement.

Years.	Classical.	Minor.	Major.	Total.
1843	73	9	—	82
1844	73	14	1	88
1845	88	14	7	109
1846	86	13	10	109
1847	82	11	12	105
1848	79	24	21	124
1849	103	23	21	147
1850	50	22	19	91
1851	74	30	24	128
1852	46	46	41	133
to April.				

On comparing the lenient examination of the Pharmaceutical Society with the very stringent examinations in force on the Continent, and comparing the number of candidates who voluntarily submit to this lenient examination with the number of persons who annually commence business in this country as Chemists and Druggists (which is computed at not less than from 200 to 300), no doubt can exist as to the necessity for a legislative enactment to place our pharmacutists on a par with those in the other states of Europe.

During the past year, a correspondence has taken place between the Council and the Members of the Society in Scotland, which has resulted in the appointment of a Board of Examiners to sit in Edinburgh. The Council believe that advantage will arise from this concession, as it had previously been a source of complaint that candidates in Scotland were expected to come to London for examination. In order to ensure uniformity of qualification, the President and Vice-President of the Society are *ex officio* Members of the two Boards. The Council consider it highly desirable to unite the influence of the Scotch and English Members as closely as possible, and thus to promote their harmonious co-operation in carrying out the objects of the Society.

THE LIBRARY AND MUSEUM.

SOME additions have been made to the Library during the past year, by the purchase of standard works, and the erection of two more bookcases. The Council are of opinion that it is desirable to purchase, from time to time, the most important works relating to Chemistry and Pharmacy, and the attention of the Library and Museum Committee has been especially directed to this subject.

In order to make the Library more generally useful, the Council have lately adopted a plan for the circulation of the books. The regulations having been published in the Transactions of the Society, it is not necessary to recapitulate them. A catalogue is in course of preparation, and will shortly be issued.

The Museum has been considerably enlarged, by the reception of many contributions from the Exhibition of 1851, and two large cases have been purchased for the reception of the specimens.

THE BENEVOLENT FUND.

THREE applicants have received relief from this Fund since the last report. As this did not absorb the entire sum at disposal for the year, the balance has been added to capital. Although the demands upon the Fund have not hitherto been numerous, the Council think it highly desirable to persevere in the accumulation of capital, to be held in reserve for the benefit of those who may be overtaken by unexpected or inevitable misfortunes. Such a Fund will serve as a bond of union among the Members and Associates—an object contemplated at the time of its commencement—and it will indirectly promote the prosperity of the Society, by increasing its strength, which is dependent upon unity.

PHARMACEUTICAL LEGISLATION.

WHATEVER may be the fate of the Pharmacy Bill now before Parliament, some progress has been made during the present session. Evidence has been taken by a Select Committee of the House of Commons respecting the state of Pharmacy in Great Britain and in other countries, the exertions of the Pharmaceutical Society for the removal of existing abuses, and the plan proposed for that purpose, with the opinions of various authorities on the subject. This evidence is placed on record; and if the early dissolution of Parliament, or any other circumstance should prevent the passing of the Bill during the present session, the recorded facts will be available on the re-assembling of Parliament.

The evidence above referred to places the Society in possession of information as to the grounds upon which the Bill has been opposed, and the arguments adduced in support of the same. The only objections worthy of notice are, *FIRST*, The impression that the Bill will create a monopoly, and deprive the public of the convenience of purchasing common medicines of grocers and general dealers, in small villages or other neighbourhoods where there is no regular Chemist and Druggist; and, *SECONDLY*, The fear entertained by some medical practitioners that the Chemists are following in the footsteps of the old Apothecaries, and endeavouring to become medical men.

The Council believe both these objections to be altogether imaginary. The Bill does not propose to interfere with the sale of common medicines by grocers and others, provided such persons do not pretend to be Pharmaceutical Chemists. The prohibition is not against the exceptional cases in which the necessities of the public may require that medicines should be obtainable from such persons, but it is against the fraudulent assumption of a pretended qualification. On the other hand, the entire medical profession being exempted from all interference, the Bill confers no monopoly in that direction. The Council are aware that some Members of the Society have considered the Bill not sufficiently stringent in its provisions for the protection of Pharmaceutical Chemists, but it would have been impossible to carry out all that was desired in this respect, and the policy of the concession is demonstrated by the fact that the doubt whether this concession is sufficiently explicit has been a source of objection. In the opinion of the Council, the Bill will have an important influence in raising the character and position of the Pharmaceutical Chemists, although it will not effect all that some parties desire.

The second objection above stated, is founded on the belief that the improved *status* and position will tend to convert Chemists into medical practitioners, and those who entertain this opinion, desire the introduction of a clause prohibiting Chemists, under a heavy penalty, from prescribing either in their own shops or elsewhere. It would be inconsistent to enforce this provision against Chemists for the protection of medical practitioners, and to deny to Chemists a similar protection against unqualified vendors of medicines. The same principle is applicable to both cases, and the Pharmacy Bill avoids this inconsistency by granting on one side all that is claimed on the other. The Council believe that the direct tendency of the Bill will be the reverse of that which has been above stated, that it will tend to promote a better understanding between Medical men and Chemists with regard to their respective functions, and will ultimately lead to the separation of Pharmacy from medical practice, by mutual arrangement, to an extent which could never be carried out by party contentions and obnoxious penalties. It must be remembered, that whatever encroachment may be made by Chemists on the province of the medical practitioner, the encroachment is mutual; and that so long as medical men keep shops and carry on trade as Chemists, they are provoking retaliation, and fostering a kind of competition injurious to both parties and to the public. This evil is aggravated by the circumstance, that the Chemists, having no recognized *status* in their own province, are not restrained by the moral influence of professional ethics, but each individual acts according to his own caprice, and those who transgress

beyond due bounds bring discredit on the entire body. The Pharmaceutical Society has always resisted the introduction of the system of persecution which has been attempted by some of the advocates of medical reform, but has, at the same time, carefully abstained from any assumption of medical functions, and has endeavoured to promote a reform of abuses by means of improved education and the recognition of Pharmacy as a distinct professional pursuit. The Council believe that this course is conducive to the mutual interests of the parties concerned and the public at large, and recommend a continuance of the same line of policy.

Mr. BARTLETT moved the adoption of the Report. He had attended the annual meetings of the Society for many years, and had assisted in its proceedings. He trusted that before the next anniversary, the Society would be placed in a better position, by the attainment of that legislative sanction to which they had been looking forward for so many years. Their progress had been satisfactory, although not so rapid as they could have wished; and he hoped the School of Pharmacy would be kept up, notwithstanding the expense, until the objects of the Society had been fully carried out, and the Legislature had passed an Act which would ensure the success of private schools, by creating a demand for education. In the meantime where could the student go to obtain a complete and scientific knowledge of his business?—and how could they expect to improve the rising generation except by furnishing the means of instruction? It was satisfactory to observe the progress which had been made by many of the students, and the increase in the number of those who voluntarily came forward for examination. It was not to be expected that the school could be remunerative under existing circumstances. It must be attended with considerable expense, as the students were provided with a complete course of instruction at a very trifling fee, and it could not be otherwise while education and examination are altogether voluntary. The young men would discover by experience that their exertions were productive of great benefit in after life, and others would follow their example. The number was obviously increasing, as about forty had passed the major examination within the last half-year. The circulation of the books would be attended with advantages, and the enlargement of the Museum was encouraging. It was in fact already unequalled, and should be maintained as the most complete Museum of the kind in this country. He was glad that a satisfactory union had taken place with the Members in Scotland in the formation of a Board of Examiners, as such union would be useful, and increase the influence of the Society. He had also observed with pleasure the harmony which had prevailed among the Members in their discussions relative to the Pharmacy Bill, which he trusted would soon become law. He had much pleasure in moving the adoption of the Report.

Mr. CLARKE, of Richmond, seconded the resolution, and fully concurred in the sentiments expressed by the mover.

Mr. HOLLIER, of Dudley, without imputing blame to any one, regretted to observe a falling off in the number of the Country Members. He thought this arose from a mistaken notion and the shortsighted cry of *cui bono*. The question was sometimes asked—of what use is the Society to us who reside at a distance? and he might answer that question by adverting to the Bills which had on several occasions been brought into Parliament, and which would have inflicted serious injury on Chemists and Druggists if they had not been successfully opposed. If all would unite and co-operate for the general good, instead of merely crying to Jupiter, they might not only be preserved from injury, but might expect to improve their position and *status*. Although there were some advantages of the Society in which the Country Members could not participate, yet there was quite enough to induce all to support it if they would view the subject in its right light. He had sent one of his young men to the School of Pharmacy, and he had improved himself more than he could otherwise have done, which had enabled him to obtain a very good situation. He (Mr. Hollier) would be glad

to know whether young men who had passed the examination, continued to subscribe to the Society? He considered this to be their duty as an acknowledgment of the benefit they had derived. The report respecting the Benevolent Fund was not encouraging. The amount of this fund was very small compared with the funds raised by the grocers and other classes for a similar purpose. It had been observed that the Country Members were not fully represented on the Council; but he had himself asked several Members to allow him to nominate them, and they had declined, apparently unwilling to undertake the trouble and responsibility. He hoped the exertions in carrying the Pharmacy Bill would be persevered in and attended with success.

The PRESIDENT stated that endeavours had always been used to make the Society useful to Country Members, and to induce them to co-operate. There were several Country Members on the Council.

Mr. DRANE observed, that the attention of the Council had been directed to the secession of some of the young men who had passed the examination, and a return had been obtained showing that the number who had thus retired from the Society was about thirty per cent. He thought this was not creditable to the parties, after the exertions made by the Society and the expense bestowed on their education, to which they were indebted for success in after life. It had been in contemplation to require an examination fee in one sum in lieu of an annual subscription, but this question had been postponed on account of the proceedings in reference to the Pharmacy Bill, which would occasion the necessity for a general revision of the regulations.

Mr. HEMINGWAY thought some explanation was necessary, as some of the Students were strangers, never having been connected with the Society, who merely came to the School for their education, and then left it. He thought this was an abuse of privilege which ought to be guarded against.

Mr. HOLLIER wished it be understood that he did not grudge the money expended on the School. He thought it was well laid out. He would have been glad of such an opportunity of improvement himself when he was a young man, and was an advocate for affording this advantage to the rising generation. He hoped the arrangements of the School would not be abridged on account of the expense.

Mr. PEDLER thought it desirable not to narrow the sphere of the Society. It was not intended merely for the few, but he hoped it would ultimately embrace all Chemists and Druggists. He thought the accounts satisfactory. The remarks of Mr. Hollier were similar to those which had been made at previous annual meetings. Every effort had been used to extend the Society and its usefulness. The subscription had been reduced at the desire of the Country Members, and their wishes were attended to when made known. If they wished to maintain their ground, they must go forward. It was not safe to stand still, as in that case they would be crushed by other parties who were using efforts to keep them down, and prevent their recognition as an educated body. He thought the Country Members were fairly represented on the Council. Their assistance was always acceptable, but there were onerous duties to be performed which could only be done by the London Members—frequent meetings of Committees, and other responsibilities. None knew the amount of the labour but those who had to perform it. With regard to the Benevolent Fund, he confessed that he was more anxious to do away with the necessity of that Fund by improving education, and thus affording to young men a better chance of providing for themselves, than to afford a pittance to them which could only produce temporary benefit. At the same time, there were cases of unforeseen misfortune for which provision ought to be made.

Mr. EDWARDS, of Dartford, believed he was the only Country Member of the Council then present. He generally attended the Council, and he could testify that the interests of the Country Members were well attended to. He formerly was under the impression that the country trade was not represented; but he found that the Council were fully aware of all the circumstances, and made

every allowance for the difference between town and country business, and that in other respects due regard was paid to the interests of all. He attributed this to the fact that there were always on the Council several Country Members. He was glad to observe the friendly spirit with which the comments had been made on the proceedings of the Society, and he trusted that this harmony among the Members would continue to prevail.

Mr. PHILPOT thought the educational expenses of the Society rather heavy. He did not wish to blame the Council, but he thought it would be better, instead of keeping up a school at so great an expense, to publish courses of lectures which might be useful to all the Members in town and country. He thought the Council ought to publish their own Transactions separately, instead of adopting the Pharmaceutical Journal. He had heard of some dissatisfaction among the Members, and thought the Annual Meeting was the proper time for them to come forward and express their sentiments: he should be glad to hear any remarks from the Members present.

Mr. BARTLETT was not aware of any dissatisfaction among the Members. During the time that he was on the Council, the business had been conducted in a most amicable and harmonious manner; he had never heard of discontent prevailing, and he knew that the Council were always desirous of attending to the wishes and interests of the Members. He objected to the publication of courses of lectures as a substitute for the school; he thought this would be attended with very little benefit compared with that of practical instruction.

The CHAIRMAN thought the apprehensions of Mr. Philpot were quite without foundation. In all societies difference of opinion occasionally arose on minor points. At a recent meeting of the Council, there was what he might call a small hailstorm, which lasted about five minutes, and then the sun shone as bright as ever.

Mr. HUMPAGE, as one of the Auditors, could testify that the accounts of the Society were kept in a most clear and business-like manner. They might see at a glance the entire receipts and expenditure, and on any point requiring explanation he had always found the Secretary not only ready to answer any questions, but desirous of giving the fullest information as to the minute details of the expenditure. He regretted to hear that so many young men retired from the Society after having derived benefit from it. If this arose from poverty, it was not their fault, but otherwise he thought it was their duty to contribute to an institution to which they owed a debt of gratitude.

Mr. REDWOOD said it was only fair to the young men to whom allusion had been made, to state that some of them were dead, others had retired from the business altogether, and others he had ascertained were not in circumstances admitting of their continuing their connection with the Society. Of the thirty per cent. who were said to be defaulters, he believed more than two-thirds came under one or other of the above categories; and he thought if the case were fairly stated there was not much ground for complaint.

Mr. BOTTLE, of Dover, said that some explanation was required before he could concur in the remarks of the Auditor. There was an item of about £100 in the last Report which he could not understand. It appeared to be a deficiency in the receipts which was not explained. He thought it desirable that the Country Members should be more fully represented on the Council, and intended to nominate Mr. Hambrook, of Dover, as a candidate. The Chemists at Dover had lately established a small reading society for the purchase and circulation of books, and they held meetings occasionally. He had applied to the Secretary for a catalogue of the books in the library of the Society, and was surprised to find that there was not a catalogue printed. He feared the Librarian was too much occupied, and that some assistance was requisite. He highly approved of the exertions which had been made to obtain the passing of the Pharmacy Bill.

The SECRETARY explained that the item in the Report, to which Mr. Bottle

referred, denoted the amount of deficiency in the receipts as compared with the expenditure in the Laboratory account. It was correctly stated in the Report. A catalogue of the books was in course of preparation, but was not yet completed.

Mr. JACOB BELL reported the proceedings in reference to the Pharmacy Bill, and explained the alterations which had been made in it by the Select Committee of the House of Commons. He regretted to inform the Members that the Bill was no longer the one which he had introduced, and which had been in circulation. It had been cut down and altered so much, that it would be for the meeting to consider whether they would assent to it or not. There was, however, this alternative, either to take what they could get, or to get nothing. It was his impression, and he had been advised by his friends in the House, that it was policy to accept the Bill as offered, that it would be better even to obtain a Bill merely confirming and amending the Charter, than to allow the question to stand over until next session, and if supported by the meeting he should use every exertion to pass the Bill without delay. The Select Committee had not finally decided, but would meet once more, and he would endeavour to obtain some amendments, if possible. It was the original object of the Bill to include within its operation all Chemists and Druggists in the kingdom, restricting in future to qualified persons the use of the term Pharmaceutical Chemist, or any other name or sign, &c., implying qualification. But the Committee decidedly objected to this, which they considered too sweeping a measure, on the ground that it would be an interference with *free trade*; and all that could be obtained was the recognition of Pharmaceutical Chemists, or Pharmaceutists, as the qualified "Pharmaciens" of this country, and the exclusive use of this designation by those who are duly registered. This would not effect what was originally contemplated, but it would give a more permanent and influential character to the Society, and might be considered a step in the right direction. The difficulty of carrying a Bill through Parliament unless backed by Government influence, was much greater than the Members of the Society had imagined. But in the event of the Bill being carried and afterwards found insufficient for the object intended, it might be less difficult to amend it by another on a future occasion. The evidence taken before the Committee showed plainly that the standard of qualification of the Pharmaceutical Chemists in this country was much below that of the Pharmaciens on the Continent, and that their united efforts in carrying out the objects for which the Society had been established were as necessary as they had ever been. Dr. MacLagan, who had attended as a witness from Edinburgh, had laid before the Committee a series of resolutions which had been passed by the Royal College of Surgeons of Edinburgh in the year 1834, and which were so much in accordance with the principle of the Pharmacy Bill, that he thought they might be interesting to the meeting. They were as follows:—

"That provision should be made in regard to Chemists and Druggists, for their being found sufficiently qualified to compound, prepare, and dispense medicines; and that no person ought to obtain a licence to act as such who has not, firstly, attended at least one full course of lectures on Chemistry, Botany, *Materia Medica*, and Pharmacy, by recognized teachers; secondly, been employed for two years in compounding and preparing medicines under a licensed General Practitioner or licensed Chemist; and, thirdly, given proof of having had opportunity to acquire a competent knowledge of the Latin language. That previously to obtaining such licences the candidates should undergo an examination in Chemistry, Botany, *Materia Medica*, and Pharmacy, and as to their knowledge of the Latin language. That those persons only who have gone through the specified education and passed this examination should be entitled to the name of licensed or approved Chemists or Druggists, or to such other designation as may imply their qualifications; but that the licence granted to them should infer no right to exercise the duties of General Practitioners."

These Resolutions, which formed a part of a Report of a Committee on the general regulation of the Medical profession, were passed *nem. con.*, while the other portions of the Report gave rise to much discussion and some difference of opinion. The principle of the Resolutions had been supported by the

opinions of several influential and intelligent medical and chemical witnesses. A provision had been introduced into the Pharmacy Bill, stating that the examination should not include the theory and practice of medicine, surgery, or midwifery; and it was also provided that no medical practitioner could be registered under the Bill. This was considered a sufficient guarantee that the Society was a *Pharmaceutical* and not a *Medical* body, and it was in accordance with the principles adopted and maintained by the Society from the date of its establishment. He (Mr. Bell) had always endeavoured to promote the separation of Pharmacy from Medical Practice, and to discourage the encroachment of Chemists on the province of medical men; but he had resisted, and would continue to resist any attempt to subject the Chemists to a system of penalties and persecution in the manner which some persons had proposed. He read a few extracts from the evidence showing that, while all the witnesses admitted the necessity of education in those who dispense prescriptions, some of them objected nevertheless to any Bill for improving the education of Chemists, unless accompanied by a penal and restrictive clause relating to medical practice. Other witnesses maintained that education in their own legitimate pursuit was calculated to check the abuses complained of, and would have a tendency to effect by moral influence and intelligence that which could not be done by penal enactment. He hoped the Members of the Society would continue to be united in the determination to obtain and secure their proper status as *Pharmaceutists*. He thought the ultimate success of their efforts rested entirely with themselves. On an occasion like the present, when a legislative enactment of that kind was to be discussed, he should have been glad to see a more numerous attendance; and he was convinced, that if the Members generally would take a more active part in the proceedings, they would very much strengthen the hands of those upon whom devolved the chief labour of protecting their interests. He would be glad to hear the opinion of the Members present respecting the altered Bill, and would act according to instructions received. Although much mutilated, it was his decided opinion that the Bill, even in its present shape, was better than none, and that it was highly desirable, if possible, to pass it during the present session.

Several Members expressed their assent to this proposition, and it appeared to be the unanimous opinion of the Meeting that it was desirable to use every effort to pass the Bill.

The resolution, "That the Report of the Council be received, and published in the Transactions of the Society," was then put by the Chairman, and carried unanimously.

Mr. HOLLIER, of Dudley, moved, and Mr. DAVY seconded, a vote of Thanks to the Council, which was carried unanimously; and was acknowledged by Mr. DEANE, Vice-President.

The President announced that the next business would be the election of the new Council and Auditors.

Mr. HAMBROOK, of Dover, and Mr. EDWARD EVANS, of Liverpool, having been nominated, in addition to the list already issued, as Members of Council, the following Members were appointed by the Meeting as Scrutineers, viz., Mr. G. W. Sandford, Mr. H. Philpot, Mr. E. M. Burden, and Mr. Henry B. Cocksedge.

Upon their report being received, the Chairman declared the following to be

THE COUNCIL.

(BY LOT.)

DEANE, HENRY, Clapham.
 DICKINSON, WILLIAM, 16, Cambridge Street, Hyde Park.
 HEMINGWAY, WALTER, 20, Portman Street.
 HORNER, JAMES T., 20, Bucklersbury.
 LESCHER, JOSEPH S., 60, Bartholomew Close.
 SOUTHALL, WILLIAM, 17, Bull Street, *Birmingham*.
 SQUIRE, PETER, 277, Oxford Street.

(BY ELECTION.)

BELL, JACOB, 338, Oxford Street.
 BIRD, WILLIAM L., 42, Castle Street, Oxford Street.
 BUCKLEE, WILLIAM H., 86, New Bond Street.
 DAVENPORT, JOHN T., 33, Great Russell Street, Bloomsbury.
 EDWARDS, GEORGE, Spital Street, *Dartford*.
 EDWARDS, JOHN B., 42, Berry Street, *Liverpool*.
 GARDEN, FELIX R., 372, Oxford Street.
 GIFFORD, JOSEPH, 104, Strand.
 HANBURY, DANIEL B., Plough Court.
 HERRING, THOMAS, 40, Aldersgate Street.
 HOOPER, WILLIAM, 24, Great Russell Street, Covent Garden.
 INCE, WILLIAM, 31, Southampton Street, Covent Garden.
 MACFARLANE, JOHN F., 17, North Bridge, *Edinburgh*.
 PIGEON, RICHARD H., 31, Throgmorton Street.

AUDITORS.

COBB, ROBERT C., 10, Frederick Place, Hampstead Road.
 CONSTANCE, EDWARD, 37, Leadenhall Street.
 DAKIN, JOSEPH, 248, High Street, Poplar.
 ORRIDGE, BENJAMIN B., 30, Bucklersbury.
 TUCK, WILLIAM H., 1, Grove Street, Mile End.

A vote of thanks having been passed to the Chairman, the Meeting separated.

CONVERSAZIONE.

THE Council, anticipating the presence of many Country Members at the Anniversary Meeting, on Tuesday the 18th of May, appointed the following day, Wednesday the 19th, for a CONVERSAZIONE, thus offering a twofold inducement for the attendance of those residing at a distance. The House of the Society is well adapted for such reunions, and the collection of specimens with which the Museum is so amply supplied, always affords, in addition to those contributed for the occasion, abundant matter for instructive conversation. The attendance was numerous.

The Council were indebted to the following gentlemen for objects of interest, which were distributed through the rooms :—

Mr. Samuel Highley, Jun., a case illustrating sulphur in its native, crude, refined, and pharmaceutical forms. It contained specimens of *native sulphur*, *crystallized*, *massive*, *compact*, and *earthy*, such as occur at recent and extinct volcanoes, in hot springs and solfataras; in the blue clay, gypsum deposits, and brown coal of the tertiary formation, and occasionally in the carboniferous and even older formations. Of the metallic sulphurets, *iron pyrites* Fe S_2 , and *copper pyrites*, Cu S , Fe S_2 , of such general geological and geographical distribution. Samples of the *crude product of native sulphur*, of which about 1,540,000 cwts. are furnished by Sicily alone, and *crude drop sulphur* or *Tropffschwefel*, of the German markets, obtained by the distillation of the metallic sulphurets, by which process, about 23 per cent. of the sulphur is given over. *Lump sulphur*, sulphur refined by distilling the crude article into huge conical moulds, six feet high, and *roll sulphur* the same, cast in cylindrical moulds; *sulphur sublimatum*, obtained by condensing the vapour of sulphur on the walls of dome-shaped chambers; *sulphur præcipitatum*, considered by Rose to be sulphur with per-sulphide of hydrogen adhering to it, obtained by the precipitation of sulphur from aqueous solutions containing hydrosulphuric acid. This preparation is often largely adulterated with sulphate of lime, as was shown by the large amount of that body remaining in a crucible previously filled after the sulphur had been burnt off, as well as by a microscopic preparation, showing a vast number of crystals of sulphate of lime, but slightly interspersed with sulphur præcip.; *sulphur vivum*, the dregs of the distilling vessels, which contain, besides other impurities, occasionally arsenic, *Crystals of rhombic sulphur*, from its solution in *bisulphide of carbon*, one crystal measuring about

two inches by one*, from its solution in camphine, at temperatures varying from 170.6° Fahr., to 280.4° Fahr., the solutions at lower temperatures giving the darker coloured, but most perfect and brilliant crystals, those at a higher, depositing acicular and cavernous crystals, or groups connected with each other, in the direction of the verticle axis; crystals deposited from sulpho-pentachloride of phosphorus, at 244.4° Fahr.; crystals of *monoclinic sulphur*, obtained by fusion at 233.6° Fahr.; with glass models, showing the difference in the position of the crystallographic axes in rhombic and monoclinic crystals of sulphur, and models of the primitive and secondary forms belonging to its two systems of crystallization. Mr. Highley noticed, that whilst rhombic sulphur dissolved freely in camphine, *freshly made monoclinic sulphur* does not, or only sparingly, and remains as a *pasty mass*, which settles down into a deep orange coloured oily globule, on the addition of sublimed or rhombic crystals of sulphur, a point he considers perhaps worthy of notice in connection with inquiries respecting the allotropic conditions of sulphur.

Dr. Percy, a collection of Chinese mineral Materia Medica, consisting of the following substances :—

Chinese Name.	English Name.	Chinese Name.	English Name.
Pih sin	Arsenic, white	Yin tsing shih	Talc, white
Hung sin	Ditto, red	Kin tsing shih	Talc, yellow
Heunghwang	Orpiment	Teze shih ying	Fluor Spar
Deitan, or	Litharge	Gokwan shih	Stalactite
Hwangtan		Shih heae	Fossil Crabs
Yuen fun	White Lead	Shih yen	Fossil Shells
Hungsha	Corundum	Haifow shih	Coral
Chihshihche	Calamine	Tan tsen shih	English names not known
Choo sha	Cinnabar	Chung foo shih	
Chooshamö	Impure Cinnabar	Yin mung shih	
Tai chay shih	Hematite	Kin mung shih	
Ling teze shih	Magnetic Iron Ore	Shay han shih	
Lew hwang	Sulphur	Fow kan shih	
Teze hwang	Sulphur	Yükin	
Lüh fan	Sulphate of Iron	Wooming e	
Tan fan	Sulphate of Copper	Shih kené ming	
Yuen ming fun	Sulphate of Soda	Hanshwuyshih	
Päng sha	Borax	Tungtan	Used to cure Ring-worm
Tung löh	Acetate of Copper	Teë sën fun	
Teze jen tung	Native Copper	Wei lew hwang	Curious and dear
Yinchoo	Vermilion	Heuen tsing shih	
Hwang shing	Nitrate of Mercury	Yu leang shih	English names not known
Hung shing	{ Nitric Oxide of Mercury	Fehwö shih	
Kingfun	Calomel	Hwaluy shih	
Pih shih ying	Carbonate of Lime	Lungküh, or Dra- }	Fossil Bones ?
Hwö shih kwei	Steatite	gon's Bones ... }	
Hwö shih kwei	Ditto	Lunahe, or Dra- }	Fossil Teeth ?
Kwang fun	Chalk	gon's Teeth ... }	
Yangke shih	Asbestos	Hachin sha	?

These specimens were received by Dr. Percy from Harry S. Parker, Esq., one of H. B. Majesty's interpreters at Canton.

Dr. De Vry, Rotterdam,—1. Liquid camphor from *Dryobalanops camphora* of Sumatra—2. Resin and ethereal oil obtained from No. 1.—3. Solid camphor from *Dryobalanops camphora*—4. Nitro-glycerine.

* We are informed by Mr. S. Highley, that this, and a somewhat smaller crystal intersecting it, was the sole product from a pint of bisulphide of carbon saturated with sulphur; as the solvent evaporated, the solution passed from a lemon yellow to a deep orange colour, and no sign of crystallization was evident, till rather less than an ounce remained, when it rapidly evaporated, and deposited these intersecting crystals almost instantaneously.

Mr. D. Hanbury, Yue-Kin, a species of turmeric from China.

Mr. A. Faber a specimen of musk-pods found in a parcel of Assam musk. These pods contain no musk in them, presenting, on being cut open, a mass of membranous matter—a sort of malformation. There is no appearance of their having been falsified.

Mr. M. T. Raymond, 2, Corbet Court, Gracechurch Street, *The Mackenzie Triturator*.

FIG. 3.

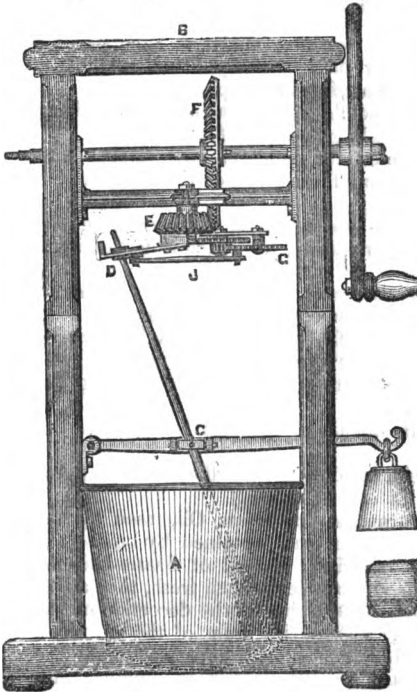
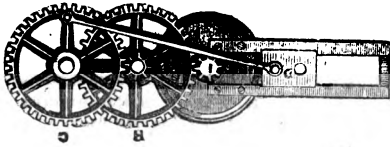


FIG. 1.

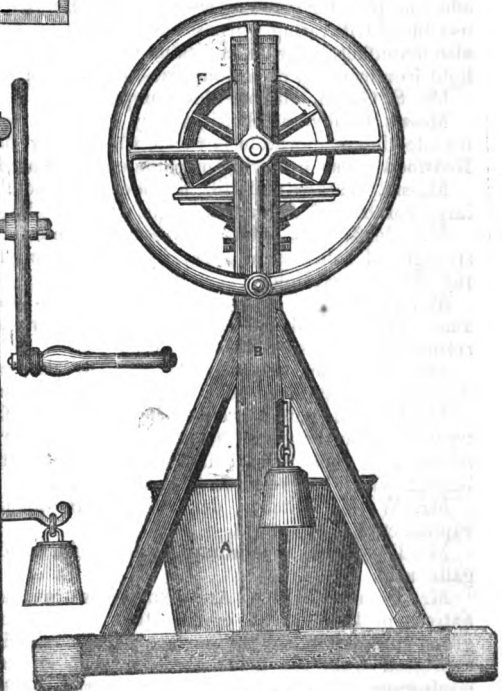


FIG. 2.

This apparatus is intended to perform the heavy pestle-and-mortar and other mixing operations involved in the manufacture of ointments and paints, and for the several processes of frictional mixing with which the Druggist's apprentice is, unfortunately for himself, too familiar. The abrading or trituration action is performed by a pestle, with an ingeniously arranged differential motion, which we shall describe with the help of three illustrative figures:—Fig. 1 is a front elevation of the triturator, showing the pestle and actuating gearing; fig. 2 is a corresponding side elevation; and fig. 3 is a detail of the gearing for the differential movement of the pestle. The mortar, A, is seated in the base of a timber frame, B, the upper part of which carries the driving shaft and connections. The pestle has a long rod passed, at C, through a universal joint in a weighted lever, arranged to give the proper pressure to the pestle. The top of the pestle-rod is inserted into a small sliding block, D, grooved to slide along a short guide-bar, as shown in the detail, fig. 3. This

bar is fixed to the side of the bevel-wheel, *x*, running loose on a vertical stud, and driven by the large wheel, *r*, fast on the driving shaft, which receives its motion from a winch-handle. A spur-wheel, *a*, runs on a stud carried by an arm attached to the wheel, *x*, and gears with a pinion on the shaft of the spur-wheel, *h*, which latter gears with a stationary pinion, *i*, fast on the stud centre of the bevel-wheel, *x*. A rod, *l*, connects the block, *d*, to a pin in the face of the wheel, *c*, and thus the revolution of this wheel causes the rod of the pestle to be continuously traversed backwards and forwards across the centre line of the wheel, *e*, directly over the centre of the mortar beneath. This gearing involves the principle of the old "sun-and-planet" motion, and gives to the pestle a most effective rubbing action, in a compound revolving and traversing movement.

The original idea in contriving this triturator was to provide some more effectual plan for grinding sheep ointment, but its success has led to its extended use for all tritulating purposes and levigating operations. Small machines are also manufactured with moveable wedgewood mortars and pestles, scraper, and light iron framing, of various sizes, suitable for Druggists, &c.

Mr. S. Green, anticorrosion pump.

Messrs. Coffey and Smith, a very complete working model of an apparatus for effecting evaporation *in vacuo*, which they have recently fitted up for Mr. Redwood; also a blowing machine on the centrifugal principle.

Messrs. Watkins and Hill, a model of Appold's centrifugal pump, for raising large volumes of water to a height not exceeding twelve or fourteen feet.

Mr. Oertling, a polariscope saccharometer, for indicating the quality and strength of solutions of sugar, by the rotation of the plane of polarization of a ray of polarized light.

Mr. Becker, an *electrometer*, on Peltier's construction, for measuring the amount of atmospheric electricity. A *refractometer*, for measuring the light-refracting power of fluids.

Mr. Tomlinson, two magnets, formerly the property of Dr. Gowan Knight. A piece of crystallized gold, obtained by the slow cooling of a fused mass.

Mr. Bell, the patent granted in the year 1798, to Mr. Perkins, for metallic tractors; also the specification of the patent, several of the instruments themselves, and communications which were sent to the patentee describing the benefits which had resulted from their use.

Mr. W. H. Hatcher, dendritic crystallization of oxide of manganese. A capped crystal of quartz.

Mr. Davenport, crystallized benzoic acid, iodide of lead, gallic acid, and pyrogallous acid.

Mr. Deane, 1. Oil of *Andropogon Iwarancusa*, or Grass Oil, used by the natives of India as an embrocation for rheumatism, obtained by boiling the grass, and skimming the surface as the oil rises. 2. Oil of *Bassia latifolia*, expressed from the seeds, used for soap and candles; when fresh, the natives adulterate "ghee" or native butter with it. 3. Spirit of the decoction of the flowers of *Bassia latifolia*, called "Mowha," a favourite dram of the hill races. 4. Oil of *Celastrus paniculatus*, or "Malkammee oil," expressed from the covering of the seeds; used by the natives as a rubefacient in rheumatism, and internally forms a famous remedy for that curious disease called Beri-beri.

Mr. Bird, dried herbs, and some very carefully prepared specimens of ferns.

Mr. M'Culloch, a large number of specimens of medicinal plants, prepared by the American Shakers, and sold by Butler and M'Culloch of Covent Garden.

Mr. Tennant, several mineralogical specimens, including a large crystal of beryl, a mass of native copper, fossil wood, ammonites, &c.

Price's Patent Candle Company, a series of specimens illustrating the patented process, by which palm oil, and other cheap fats, are converted, by a process of distillation, into a pure and colourless fatty acid, applicable for the manufacture of the best description of candles.

Sir William Burnett, a great number of specimens, illustrating his patented process for the preservation of timber, canvas, cordage, &c., from dry-rot, or other causes of decay. These specimens consisted of wood, canvas, skin,

woollen cloth, &c., portions of which had been submitted to the action of the chloride of zinc, and then exposed, together with other portions not so prepared, under conditions calculated to promote decay. The preservative effects of the chloride of zinc were strongly marked.

Mr. W. Copney, a large and perfect crystal of chrome alum, weighing more than three pounds; a similar but smaller crystal of common alum; and one obtained from a mixed solution of chrome alum and common alum. These crystals, some of which were exhibited at the Great Exhibition, are presented by Mr. Copney to the Museum of the Society.

Mr. Gale, rock crystal cut into spherical and other forms.

Mr. Forrest, a fine piece of coral.

Mr. Longbottom, elastic wheel tyres, made of vulcanized India-rubber, for rendering the wheels of carriages, &c., noiseless, diminishing the wear and tear of the carriages, and making the motion more easy.

Mr. How, assistant to Mr. Knight, of Foster Lane, some electrotypes of leaves and fish taken from nature.

M. Claudet, a numerous assortment of *stereoscopes*.

Mr. Mayall, *daguerreotypes*.

Mr. Knight, *daguerreotypes* on collodion.

Mr. Robert Hunt, photographs by several different processes.

Mr. Newman, Wheatstone's *stereoscopes*.

Mr. Squire and Mr. Highley, *microscopes*.

Mr. George Whipple, essential oil of elder-flowers, and an alcoholic solution of the same. This oil was obtained in the distillation of elder-flower water. It is concrete, partially soluble in alcohol, and this solution, on being mixed with water, forms an opaque fragrant elder-flower water.

LIVERPOOL CHEMISTS' ASSOCIATION.

Pharmaceutical Meeting, April 2, 1852.

MR. RAWLE IN THE CHAIR.

DR. NEVINS delivered a lecture on Smoke Burning. The lecturer commenced by saying that his object would be to show how smoke might be *prevented* rather than how it might be burnt, for if once the carbon of combustible matter was set at liberty, so as in an ordinary sense to become smoke, he was not aware of any efficient means by which it could then be burnt. His object would be to prove that the prevention of smoke was in most cases possible by adopting a simple and inexpensive and philosophical plan of constructing the furnace, for which we are mainly indebted to Mr. Williams. To prevent smoke, that is to prevent the separation of carbon in a visible form from combustible matter, two conditions are absolutely indispensable. First, abundance of air, and second, a sufficiently high temperature. If these two conditions are fulfilled, smoke will be almost entirely absent; if either of them is wanting, smoke will inevitably be produced. In illustration of these propositions the following experiments were shown:—A burning taper was made to float upon water in a deep jar, over which an empty jar was inverted, and the taper was thereby carried, as in a diving-bell, below the surface of the water in the outer jar. At first it burnt as before, but as the oxygen present in the air was consumed it began to smoke, and shortly went out entirely, although the inverted jar still remained about four-fifths full of air; by which experiment it was shown that only about a fifth of the air contributed to support combustion, and that as that diminished in quantity, smoke began to make its appearance. The same point was also proved by the simple experiment of preventing air from entering a common argand gas-burner, when the gas immediately began to smoke, although burning clearly before.

In illustration of the second requisite, viz., a sufficiently high temperature, several experiments were shown, which, however apparently trivial taken separately, were conclusive of the point in question. The lecturer showed that common coal-gas consisted of hydrogen and carbon, and that these must be heated before they begin to burn, which is generally effected by the momentary application of a burning taper.

He then pointed out the difference in the degree of heat required by these two bodies before they begin to burn. On taking a jet of pure hydrogen he showed that it was heated sufficiently to inflame by the slightest application of heat (an electric spark, or the feeblest flame from a burning body); but that charcoal or carbon required the long continued application of a large spirit-lamp, or of a common fire, or even in some cases of the blow-pipe, before it was sufficiently heated to burn. If the common gas (containing both these ingredients) was but slightly heated, the hydrogen part of it might possibly burn, whilst the carbon part would not, and smoke would then be the result; which was proved by holding a plate over a common gas flame which was burning brightly. The cold plate cooled both the hydrogen and the carbon; the hydrogen, however, requiring but little heat, continued to burn; but the carbon requiring a great deal, ceased to burn, and was separated as smoke—in common language, the plate was smoked by being held over the burning gas. But if a body colder still was applied to the gas it might be so much cooled as to prevent either of them from burning, as was shown by the simple experiment of putting out a burning taper by stroking the wick two or three times quickly with the end of the snuffers; the cold metal removed the heat so rapidly and so completely from both the hydrogen and the carbon, that neither remained hot enough to continue burning, and the flame went out.

But as it had been shown that the hydrogen requires the least heat, and combines the most rapidly with oxygen (for it combines so quickly as to produce an explosion if mixed in the proper proportions and then heated), it became probable that if there was not sufficient air to supply both the hydrogen and the carbon of common gas, the hydrogen would take it all, and the carbon would be set free unburnt, *i. e.* in the form of smoke; which was proved by obstructing the supply of air to an argand burner: the hydrogen, from its greater attraction for oxygen, took all the little there was, and continued to burn; but the carbon being unable to get any was separated as smoke.

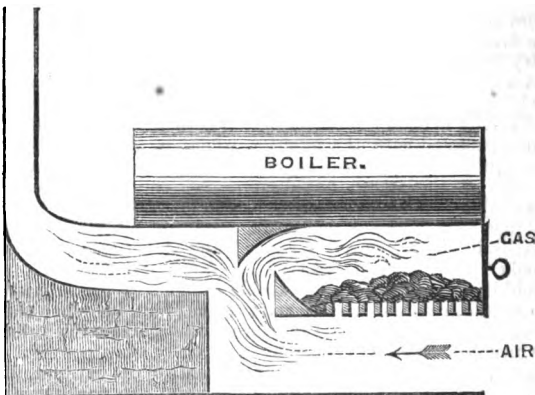
Dr. Nevins then illustrated the large amount of air requisite for burning common gas, by showing that in its purest form gas consists of two jars full of hydrogen and two jars full of charcoal vapour, condensed into a single jar. The presence of this large volume of charcoal was shown by mixing one-third, by measure, of olefiant gas (C_2H_2) with two-thirds of chlorine, and inflaming the mixture, when the whole jar became full of charcoal vapour, beside a dense column of smoke, which rose into the air. Now each jar of hydrogen requires half-a-jar of oxygen for its combustion, and each jar of charcoal vapour requires an equal quantity of oxygen—the four jars full, therefore, require two jars full of oxygen for their combustion; but the air contains only one-fifth of oxygen, and, therefore, ten jars full of air will be required to yield the two of oxygen—in other words, ten jars full of air are required to burn one jar full of coal gas.

The lecturer then proceeded to apply these principles to smoke burning in fires and furnaces as follows:—When a common coal fire is first lighted a portion of gas is expelled from the coal along with moisture, tar, &c., which causes some degree of smoke at first, but no blaze. As the heat of the fire increases, partial blazes burst out here and there, but accompanied with smoke, *i. e.*, the hydrogen is now sufficiently heated to burn, but not as yet the carbon. At a later period still, the heat being now more intense, both the hydrogen and carbon burn; the fire is enlivened throughout by bright blazes; and there is now no smoke. At a later period still, the whole of the gas being expelled from the coals, and by this time being all burnt, the flame disappears, and nothing remains but red-hot cinders, burning without smoke; and without smoke they will continue to burn until they go out entirely, because there is now no charcoal in the form of vapour to be set at liberty by the combustion of the body (hydrogen) with which it was previously combined and rendered invisible. Such is the case in a common open fire-place, from which the dense clouds of smoke never appear that are sent up from steam-engine fires, in which the arrangements are different, owing to their being closed in by doors.

It was shown in the early part of the lecture, that smoke was the consequence of either deficient heat, or a deficient supply of air. Now, in a steam-engine furnace, there is heat enough, but the supply of air is too limited. Sufficient might indeed be admitted by opening the doors, but in that case a large body of cold air would rush in, and the fire would smoke from the gas being thereby too much cooled. All the air admitted to the fire, is therefore made to come through the bars of the grate, and it certainly becomes sufficiently heated by passing through the hot coals. But

these take toll of it as it passes through them, and what little passes through unconsumed, is sufficient to supply the hydrogen of the gases evolved from the coal, but not the carbon, which therefore passes up the chimney in the form of smoke, which might therefore probably be prevented if a larger supply of air could be obtained. But how is this to be done? By making the spaces between the bars wider, and admitting more air? But then the coals will fall through into the ash-pit, and great waste will result. By employing bellows, or some contrivance to increase the draught? But then the bars of the grate are quickly burnt away, and the fire-place requires constant repairs; and the heat also becomes so intense under particular parts of the boiler, that the bottom is apt to be burnt out, and incessant expense and annoyance are the result. Is the matter then irremediable? By no means. Dr. Nevins showed large coloured drawings of the stationary furnace for the engine at the top of the Liverpool tunnel, which was constructed by Mr. Williams, and answered in a highly satisfactory degree.

In the accompanying sketch, the hot gas from the coals is directed downwards by the projection below the boiler, and is then met beyond the coals by the air which has become heated by passing below the fire and above the hot ashes in the ash-pit. The hot gas and the hot air coming in contact, combine and burst into a flame, which extends to a great distance, as shown in the diagram, and is unaccompanied by smoke, for by this arrangement



the two essentials are supplied, viz., plenty of air, and a sufficiently high temperature. On closing a damper, and preventing the air from mixing with the gas beyond the coals, the chimney instantly becomes filled with smoke, which again disappears on opening the damper, and readmitting a sufficient supply of air.

Mr. MERCER referred to a notice of adulterated borax in the last number of the *Pharmaceutical Journal*, and stated that he had examined a cask received only the preceding day from Messrs. Mander and Co., of Wolverhampton. He found it to be largely mixed with phosphate of soda, and exhibited a portion taken from the cask, which had been exposed to air and warmth. The crystals of phosphate of soda were rendered evident by their efflorescence, whilst those of borax retained their comparative transparency. He stated that he had also applied the appropriate tests.

Dr. EDWARDS exhibited one of Crosse's Patent Purifying Apparatus, which he stated "was a very simple but effectual arrangement for the complete clarification of various liquids by means of an electrical current. The process is simple:—In a vessel containing the liquid to be purified two porous cells of earthenware are to be placed, these are filled with spring water, and contain in one a cylinder of zinc, in the other of iron, which are connected by means of a copper band. The salts contained in the water are sufficient to excite the metals, and produce a feeble current of electricity, which, passing through the liquid in its passage from one cylinder to the other, causes an electrolytic action throughout, the salts in the liquid are decomposed, the bases passing to the cell containing the negative metal, and the acids to that of the positive. The liquid being thus deprived of its salts, deposits vegetable or animal matter previously held in solution, and becomes perfectly clarified and antiseptic. It has been applied with the greatest success to the purification of sea-water, soft water, infusions, tinctures, wines and oils, and will no doubt be found practically useful for a great variety of liquids which have resisted other modes of clarification."

Mr. ABRAHAM mentioned the intention to hold a Soirée by this Society, jointly

with four other of the literary and scientific societies of Liverpool; and that this Society would provide for the exhibition of the oxy-hydrogen microscope by Mr. H. S. Evans—the freezing of water in a red hot crucible, by Mr. Waldie—and the exhibition of the electric light, by the patentee, Mr. Staite.

Pharmaceutical Meeting—May 7, 1852.

MR. SHAW IN THE CHAIR.

LECTURE ON THE STARCH PRODUCING PLANTS OF COMMERCE.

BY T. C. ARCHER, ESQ.

Professor of Botany, St. Aidan's College, Birkenhead.

THE lecturer commenced by defining the physiological characters of starch to be "minute corpuscles of various forms, tending chiefly to the ovoid, having an external covering composed of successive layers of matter, arranged in a manner similar to the successive layers of bivalve shells." The matter composing the shell is insoluble in cold water, but the application of heat changes its character, for if dry heat be applied the layers or bands are seen to detach themselves from each other, curling up at their edges, and uncovering the contents of the corpuscle, which previously was in a liquid state, filling the whole of the interior. The exact character of this contained matter has not been satisfactorily ascertained. When amalgamated with the exterior, which is effected by a slight heat, its appearance and properties are changed, and it then receives the name of *amidine*. The pearly lustre of the starch has disappeared, and given place to a dull yellowish white resembling tapioca. Heated to 200° it becomes dextrine, or British gum—the article used for rendering postage stamps adhesive. This process takes place more easily in plants; starch is never found absent from vegetable matter, and it may be looked upon as food reserved for future nutrition; its outer covering, insoluble in cold liquids, preserves the soluble contents of the interior from being dissolved and wasted during the inactive state of the plant, but when the warmth of spring excites vegetation, that heat and the forces of vegetable life suffice to produce the changes which the Chemist effects by apparently more powerful means. The starch-shell cracks and fuses with the liquid contents of its interior, forming first *amidine*, then gum, next sugar, and finally carbon, and the peculiar secretions of the vegetable. Pure starch is obtainable with difficulty, requiring long-continued and careful alcoholic washings to free it from the albuminous and fatty matters with which it is always more or less associated, and which cause the difference in its appearance when obtained from different plants. When perfectly pure it is beautifully white and glistening, and is not adherent by pressure, not even if moistened and dried. There is observable usually at the narrow end of the ovoid starch corpuscle a small spot around which the concentric layers are formed. This spot was supposed to be a thickened point, but has been proved to be a transparent depression, which has received from the German physiologists the name of *Fritsch's Nucleus*.

The starches of commerce are derived from various families of the vegetable kingdom; all the cereals produce it abundantly, especially wheat, which is the variety chiefly used for manufacturing purposes. It is now largely imported from the East Indies, and in a highly prepared form from Germany. Next to the graminaceæ, the palmaceæ are most important in producing *fecula*. Sago, the product of several palms, is principally made from *Sagus Rumphii*, *S. lævis*, *S. farinifera*, *Phoenix farinifera*, *Caryota urens*, and *Saguerus Rumphii*. In order to obtain it the palms are cut down, the stems split in pieces, and the medulla or pith is extracted. This is very abundant, and consists of cellular matter almost filled with starch. The pith is pounded with wooden pestles and mixed with cold water, in which the woody matter floats and the *fecula* subsides; the water is decanted, and the sediment dried and powdered. In this state it is the *sago-flour* of commerce, which is largely imported from the East, and used for stiffening textile fabrics. One palm will often yield five cwt. of sago. For dietetic purposes it undergoes several further processes of edulcoration, and is then granulated; after which the natives, by some manipulation known only to themselves, give the grains the pearly lustre which is so marked a characteristic of pearl sago. We receive three kinds: the *pearled* sago, in very small grains; *granulated* sago, about the size of mustard-seeds; and *Borneo* sago, which is not unlike radish-seed, both in size and also the reddish-brown colour. The last is by no means common.

Arrowroot is the product of several species of *Maranta*, but chiefly *M. arun-*

dinacea (Marantaceæ). It is procured by pounding and macerating the large underground buds of the rhizomes, and not from the roots, which are small and fibrous; it is generally nearly pure. There are several varieties in commerce. *Tous les Mois* is the fecula obtained from the rhizoma of *Canna coccinea* (Zingiberaceæ); East Indian Arrowroot, from the round pendulous tubers, which hang like small potatoes from the rhizoma of several species of *Curcuma* (Zingiberaceæ), particularly *C. angustifolia*, the rhizomes of which constitute the turmeric of commerce. Tapioca is procured from the *Janipha Manihot*, a Brazilian plant of very poisonous properties. The roots first yield a juice which is so poisonous that it is used by the Indians to poison their arrows; but by boiling, it is rendered not only innocuous, but is converted into a valuable sauce for roasted meats, under the name of *Cassaripe*. The starch is then procured by edulcoration from the large tuber-like roots, and is laid to dry upon hot plates; whilst drying, the paste is stirred with an iron rod, which breaks it into the irregular rocky appearance of commercial tapioca, at the same time the heat dispels the poisonous properties. The lecturer also described the feculas of the potato; *Encephalartus caffer*, or the *caffre-bread*; *Dion edule*, the Mexican arrowroot; the *Cycas revoluta*, and *C. circinalis*; *Arum maculatum*, and various others, which were illustrated by an extensive series of coloured diagrams.

ORIGINAL AND EXTRACTED ARTICLES.

EXAMINATION OF PAVON'S COLLECTION OF PERUVIAN BARKS CONTAINED IN THE BRITISH MUSEUM.

BY JOHN ELIOT HOWARD, ESQ.

(Continued from page 498.)

Var. β *Candollii*.No. 4. *Cinchona cascarilla de Quiebro de Cuenca de Loja*.

This is No. xxv. on the wood; the adhering bark has the appearance of common "crown bark."

The character of the specimen of bark itself is that of a badly rolled, inferior *Loxa*: it is convoluted, twisted, ragged, torn; fibrous throughout, but the fibre is not rigid; the cracks are feebly impressed, the edges scarcely everted; the peel of the bark is much smoother than the *Uritusinga* bark; it is flexible, and appears darkened with age.

This, according to M. Guibourt, is the *Quiebro de Loja, amarilla de Loja, Cinchona macrocalyz*, Pavon, of M. Delessert's collection, lettre 1°.

It must, therefore, take its place under *C. Condaminea* var. β *Candollii*, Weddell, *Histoire*, &c., p. 38.

"Cuenca" is given by Dr. Weddell as the *habitat* of the var. β *Candollii*.

No. 34. "*Cinchona quina negra* 2°. *Especie de Loja*," Lambert omits "1° Espece."

Probably No. iv. on the wood, which is labelled *C. negra de Azoques*, the bark adhering resembles that of *C. Condaminea*.

A botanical specimen in my possession, given me by the Museum d'Histoire Naturelle de Paris, bears this inscription, apparently in the handwriting of the collector, M. Pavon. N. 578 *C. negra de Azoques*, 2° *Esp*. This specimen is marked by Dr. Weddell, "*Cinchona Condaminea* var. *Candollii*, Weddell; *C. macrocalyx* (D.C.) Perou. Collection de Pavon donnée p. M. Rivero." I conclude, therefore, that the derivation of this bark is clear. The specimen resembles the figure given by Weddell, Pl. iv., bis A.

"*Quina negra* 1° *Esp. Cinchona de Loja*."—*Condaminea* looking bark, varying from "rasp like" to smooth "cherry," the colour brown, some split warts.

"*C. negra*, 2° *Esp. Loxa inferieure*," Guibourt. The bark is blackish *Loxa*, still with the *Condaminea* coat, and everted edged cracks, much lichen, *parmelia melanoleuca*, &c.

Var. γ lucumæfolia.

No. 55. *Quina con hojas de Lucuma*, 1^a especie. No. 10. *C. con hojas de Lucuma de Loxa*.—The *Acras Lucuma* (from resemblance to which in the leaves this species is named) is figured in *Fl. Peruv.* vol. iii., pl. 239. My specimen of this from the herbarium of Pavon, is marked "Cas. con hojas de Lucuma 1^a Exp. No. 561, &c., Loxa." There are two species of bark in the Museum: 1st species (so marked) fine large quills, resembling the specimen in possession of the Pharmaceutical Society, but with a redder substance. Pereira, "white, large quills." 2nd. species, yet more resembling the above, being paler, of brown colour in the substance.

Pereira. "Quills with white corky coat, no transverse cracks." This is No. xxviii. on the wood, the bark adhering to which has fully the silvery epidermis and corky bark characteristic of the species. On the quill of the larger branches, this character is so definite, that after having seen a package of the kind opened, it would be difficult to mistake it for any other, so unique is its character. The corky bark of the Wych-elm is the only one which I have seen at all resembling it, and this has not the silvery, lustrous coat. The canutillo, or very fine quill, however, assumes so exactly the same character as that of *C. Condaminea* (gathered by Seemann), that I am unable to detect any difference; it is that of the "*silver crown*" of Pereira. The produce in alkaloids resembles that of the other varieties of *C. Condaminea*.

That which I have examined, was imported as "crown bark," in 1848.

No. 36. *C. quina con hojas de zambo de Loxa*.—Zambo, in the dictionaries, means a *citron-tree*, or a kind of *quince*. Whatever the variation in the leaves, the bark appears to me on attentive examination, to be identical as to physical characteristics with that of *C. lucumæfolia* (No. 55).

No. 56*. *Quina hoja de zambo de Loxa*. Dr. Pereira observes that it is "white, one specimen has an oblique groove on it, as if it were impressed by a twiner, as I have seen frequently in *lancifolia* bark."

No. 22. *Cascarilla crespilla de Latuna de Loxa, vulgo de Latuna*.

This is No. xxii. on the wood, the bark of which is smooth, and wrinkled longitudinally. The first specimen of bark is in white, corky, large quills.

The second specimen, marked *Cinchona de Loxa, Quina crespilla de Latuna*, is in small quills. I have compared this side by side with the bark of *C. lucumæfolia*, and am satisfied of their entire resemblance. I should have supposed them taken off the same tree.

Dr. Weddell speaks† of a remarkable variety of *cinchona lucumæfolia*, brought from the province of Chacapoyas, in Peru, with coriaceous leaves, &c. Possibly this may coincide with the *hojas de zambo*, or with the *crespilla de Latuna*.

Var. δ lancifolia.

No. 37. "*Quina estoposa‡ de Loxa*."—This is No. xvi on the wood, the bark on which has a coating characteristic of the varieties of *Condaminea*. It is like that of the Chaharquera, rough, file-like, running into smooth, with micaceous epidermis and the same warts. The bark, as to its substance, which is reddish-brown, is a *fibrous specimen of lancifolia-bark*, resembling those which are obtained from New Granada. The small quill is like the "*Caqueta*" bark, the large, *orange-red*, with a silvery coat. A quantity which, on comparison appears the same as this, was imported, per Lucy, in 1829, *viâ* the Pacific, and several similar parcels in that and subsequent years.

Lichens on the specimen *Parmelia melanoleuca*, *Usnea barbata*, very familiar on *lancifolia* bark in commerce. Guibourt, in his *Histoire des Drogues*, 4 ed. p. 106, vol. iii., says this is his *Quinquina de Loxa rouge fibreux du Roi d'Es-*

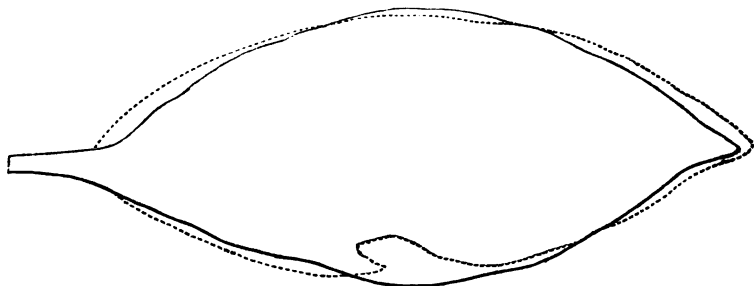
† *Histoire*, &c., p. 39.

‡ Printed by mistake "*estopara*" in Lambert.

pagne. It appears to me to be identical with M. G.'s No. 30 in the Pharm. Society's collection.

Estoposa signifies "resembling tow," and this no doubt refers to the fibrous character of the *inner bark*, which characterizes all the varieties of *lancifolia*, whilst the epithet "*tunita*," or coated, is equally descriptive of the outer surface. I conclude that it is the *stupea* (like tow) of the MSS. of Pavon, which is comprehended by Dr. Weddell, under the head *C. Condaminea a vera*.

It seems to me, that the character of the bark should remove it from under the *a* var. to the var. δ *lancifolia*. The fibrous inner bark, whence the name "fibrous Carthagena," is a most constant characteristic of the varieties of *C. lancifolia*. I have (through the bounty of the Museum d'Histoire Naturelle) in my possession specimens of *C. lancifolia*, which were given by Mutis to Humboldt, and in which this peculiarity is so great, that one might fancy that in pressing the finger against the ends of the fibres, it was touching a hard brush. Quite similar is a specimen sent from Bogota in 1850, by Don Jose Manuel Ristolfo, and accompanied by botanical specimens, which I shall again refer to. Among many hundred serons of New Granada *lancifolia*, I have never seen one in which this peculiarity did not stand out in contrast to those of *Condaminea vera*. There is direct evidence as to the botanical origin of this species in the herbarium of Lambert, in the Museum. Amongst these, is one marked "*vulgo cascarilla estoposa*." In the view of Dr. Pereira and myself, it resembles more the *C. lancifolia* of Mutis than the *C. Condaminea* of Humboldt.



Comparative size and shape of the leaves of "*Cascarilla estoposa de Loxa*," and *Cinchona lancifolia*.

The dotted line represents the outline of the leaf of the "*Cascarilla estoposa de Loxa*," contained in Lambert's herbarium. A portion of the leaf has been subjected to some injury, as shown in the lower portion of the figure.

The other figure is the outline of the leaf of Mutis's *Cinchona lancifolia*, taken from a specimen given by Mutis to Bonpland, in my possession.

It appears to have puzzled the botanists, as it is classed under *lucumæfolia* on the one hand, and on the other Lambert has marked *C. Condaminea H.B.*, on the paper of the botanical specimen.

There is evidently a slight difference between the *estoposa* and the specimen of *lancifolia* of Mutis in my possession, but the general resemblance is great. It is the same with the bark of which I have recently obtained a good specimen. It came mingled with "ashy crown bark," in serons, from Payta.

The small quills are so entirely covered with various cryptogamous plants, that they present a similar *facies* to that of the bark with which it was imported. The larger quills are more silvery, with a periderm in some cases partially exfoliating, and leaving the light brown surface of the derm covered with transverse furrows, forming a close imitation of the *C. rufinervis*, Weddell. From this bark it is at once distinguished by its "entirely fibrous" character, and this feature, with the silvery, fretted, and mottled surface of the periderm,

induce me to think the bark the same as the No. vi. *Lagartijada* of Laubert.† It would, at least, be difficult to find a term more descriptive of the appearance of the larger quills. Some of these attain a length of twenty inches, and a diameter of from half an inch to an inch.

There is yet another variety of "lancifolia bark" which comes from Peru, and of which I have recently obtained good specimens. This is in much larger and coarser pink orange quills, and in flat pieces six to ten inches long and two or three inches wide. The thick coarse character of the bark, with a smooth surface and very micaceous epidermis, in some cases varying to the rough character of *Condaminea* barks on the young quills, make me think it in all probability the *lampigna* of Laubert.‡ There are, moreover, two characteristic features of the *Calisaya* which the bark I am describing possesses, which make it easy to understand how the origin of the *calisaya* might be supposed to be traced by M. Ruiz to this bark. I allude, in the first place, to the easy exfoliation of the periderm (a characteristic feature of the *Lampigna*, according to the *Quinologia*), and the resulting aspect of the flat pieces, which are marked by *conchas*, almost as well pronounced as in many specimens of the true *calisaya*. The second feature in which this bark approaches the *calisaya* is found in the multitude of little prickles which insert themselves into the skin, when the bark is handled as it comes from the serons in which it is packed. This feature is not confined to these two barks, but is peculiarly and disagreeably prominent in them.

On the whole, however, I cannot regard these barks as commercially anything else but *lancifolia* bark. The botanical controversy between Mutis and the botanists of Peru is well known, and it is evident they had nothing *exactly* resembling the *naranjada* or *C. lancifolia* of Mutis, by their assimilating to it another bark, the *parecida à la naranjada de Mutis*, which has no sort of real connection with the *C. lancifolia*, but only a general resemblance in the coat.

It is in these barks, the *estoposa* and the *lanceolata*, that Ruiz and Pavon probably anticipated Mutis in the discovery, not indeed exactly of *his C. lancifolia*, but of sub-varieties of the same species.§

There is, in the herbarium of Lambert in the British Museum, a specimen marked *Cinchona lanceolata*, from which a plate has been engraved as *cinchona angustifolia*, and an impression of the plate accompanies the specimen. The *C. angustifolia* is given by Dr. Weddell as a synonyme of *δ lancifolia*.

There is a variety of the *C. lancifolia* of Mutis described, I think, by Laubert as the *calisaya* of Santa Fé, which exceedingly resembles the bark which I suppose to be that of *C. lanceolata*. In the former the periderm is, however, more adherent and the bark itself softer, and more easily pulverized.

† *B. de Pharm.*, ii., 299.

‡ CINCHONA LANCEOLATA (*Flor. Peruv.*)

CASCARILLO BOBO, OR CASCARILLO AMARILLO DE MUÑA.

(From the *Quinologia*.)

The *lampigna* (or *Cinchona glabra*) reaches a height of thirty-six feet, and from one root there arise two, three, or four stems, but for the most part only one; all are, one with another, three feet thick, strong and upright. The ramification is sparingly covered with leaves. The branches run upright, some horizontal, and they are strong. The tender branches carry the leaves on their summits, and in that part have four convex sides. They become strong as soon as they have thrown off their leaves. The bark of the stem and of the thick branches is *dark grey*, that of the middling branches has a clear grey colour, a mixture of ash grey and of dark grey, but the bark of the tender branches is *wholly light grey*, and has a *smooth surface*. On the stem and on the old branches, on the other hand, it is rough and *exfoliated*, less rough and exfoliated however on the middling-sized branches.

Ruiz says further of the quills that, without the outer coat, they resemble *the fresh and well-preserved quills of Ceylon cinnamon*, only that they have a *still brighter colour*. This exactly describes the bark in my possession.

§ M. Alibert received from Messrs. Ruiz and Pavon specimens of *orange bark* from Peru, which differed in some of their physical characters from those which M. Zea brought from St. Fé de Bogota. They were marked by a greater or less number of *transverse cracks*, the colour internally russet yellow, externally of a *clair obscure*, with black, grey, and white spots, and the pieces much rolled upon themselves. (*Traité des Fievres pernicieuse*, p. 380.) This must, I think, have been the *estoposa*.

These so-called *calisayas* are only and simply *lancifolia* bark, and have no connection with the genuine *calisaya*, except in the general features I have mentioned.

The *calisaya arrollada*, or *calisaya de Quito*, of Laubert, is (I think from the description) the bark of one of the varieties of *C. scrobiculata*. The var. *Delondriana* bears still the name of *calisaya* of Peru. There is some general resemblance to the bark of *C. lanceolata*, as Laubert states.

I learn that a paper was read to the Vienna Academy of Sciences last June, on "König's Chinarine welche von *cinchona lancifolia* Mutis herkommen soll." I have not yet seen this dissertation, but if the author means that the *C. lancifolia*, and not the *C. Calisaya*, is the origin of *China regia* or *calisaya* bark, he must be deceived by such appearances as I have alluded to.

There is a characteristic difference in the chemical constituents of the Peruvian and New Granada *lancifolia* barks, for, whilst the latter are rich in cinchonine, the former contains this alkaloid in a very minute proportion.

I will here give a translation of an early account of the New Granada barks published in Europe in 1779†, in the *Histoire de la Société Royale de Médecine*, p. 256, and also that of M. Ristolfo, in 1850.

"On two Species of *Quinquina* newly discovered in the Environs of Santa Fé, Memoir by Messrs. Daubenton, De Jussieu, &c. 1779.

"M. de Galves, minister at the court of Spain, has lately received specimens of two species of bark, recently discovered in the kingdom of Santa Fé. These specimens were accompanied by the barks in powder. This minister charged M. Ortega to send the specimens and boxes to the Society of Medicine, whose advice he asked as to the reception or rejection of this bark. The two specimens are well preserved, but incomplete. We may nevertheless, by the inspection of the characters which they offer, determine pretty well their species.

"The first has the leaves oval, smooth, marked by reddish nerves (*nervures*), and in all things resembling those of the red quinquina which M. la Condamine sent from Peru, and which M. de Jussieu preserves in his herbarium. The same agreement is to be remarked in the fruits. Without having seen the flowers or the fruit we may decide that it is one of the good species, and we are ready to think it is the true red bark, become so rare at Loxa."

[The bark, however, they describe as pale yellow, which would represent the *naranjada* of Mutis very well, but certainly no red bark. *Le premier quinquina d'une couleur jaune pâle comme rosée, est sensiblement aromatique, médiocrement amer, fortement astringent, &c.*]

(The 2nd under *C. cordifolia*.)

Letter of Don Jose Manuel Ristolfo, dated Bogota, 13, 12, 1850.

No. 1. Skeleton (*i. e.* dried flowering portions) of the *Cinchona lancifolia*, vulgo *tunita*, or *naranjada*. The fibres of the leaves are in general of a red colour, and this colour is deeper in the leaves of the tender shoots. This species is found on the slopes of the highest parts of the Cordillera. The tree is about twenty-five yards in height—the stem long, straight and has few branches, about one foot in diameter in the thickest part of the trunk.‡

† M. Lopez says that the discovery of the *C. tunita*, or *C. lancifolia*, to which the *cascarilla naranjada* belongs, was made by him in 1776 at Santa Fé. In this he is at issue with Mutis, who claims the first discovery. *Tunita*, or *coated*, is a very descriptive appellation, as is also the *estoposa* of Pavon, and the *naranjada* of Mutis.

‡ M. La Condamine thus describes the tree of Loxa:—"The cinchona tree is never found in the plains. It grows upright, and is distinguished at a distance from the neighbouring trees by which it is surrounded, for the cinchona trees are not found assembled in tufts, but scattered and isolated amongst trees of other species [the contrary is said of the New Granada *C. lancifolia*.] They become very large when they are allowed to attain their growth; there are some larger than the body of a man, the medium ones have eight or nine inches diameter, but it is rare to find now (1787) of this size on the mountain, which has furnished the best quinquina; the trees from whence the first barks were procured, which were very large, are all dead now, having been entirely barked, which makes the old trunks die to a certainty."

Baron Humboldt decided at last *against* the identity of the Naranjada of Mutis with the Quinquina of Uritusinga (Weddell, *Histoire*, p. 40), and, as it seems to me, with reason.

No bark that I have seen from Peru at all merits the title of *orange bark*, which is exactly descriptive of the bark of Mutis. This now has established a certain reputation in commerce, and proves neither so good as was boasted on the one hand, nor so bad as was represented on the other, in the celebrated controversy between the botanists of Peru and of New Granada.

Var. e Pitayensis.

No. 61* *Cinchona Amarilla de Yuta*, *sp. nova. ined.* called in Laubert's Memoir† *Cascarilla amarilla de Jutaf*, mentioned by Laubert (Lambert, p. 86) as "in considerable repute." Pereira, "Short, hard, white quills." Probably quilled Pitaya bark, J. P. & H.

It consists of curled pieces, two to four inches long, by one in diameter, thick, hard, lumpy, with micaceous epidermis, split warts; the smaller quills are altogether like the Pitaya bark, having cracks with everted edges, rough grater-like feel, running into smooth skinned portions—the derm maroon coloured where exposed.

The *Cascarilla baya* (Lambert, p. 85) is, I think, the browner variety of Pitaya, coming from Santa Fé. Both sorts I have seen in commerce.

In M. Delessert's collection is found a bark called *cinchona amarilla de Jutay de Chito*, ascribed to the *cinchona lutea* of Pavon, which, according to the botanical specimens of Pavon (and to the classification of the *Quinolugia* and of Lambert, &c.) is a variety of *C. Condaminea*, or perhaps more strictly of the *lanceolata*.

The leaves of the *C. lutea* are narrower than those of the *C. lanceolata* of Mutis. The var. *Pitayensis*, according to Dr. Weddell, is *foliis lanceolatis utrinque acutissimis*.

Before leaving the interesting species of which so many varieties have passed under our review, I must add, in conclusion, a few remarks, which fuller investigation of the subject require.

First, under my subdivision *yellow*, or *amarilla*, I have obtained a good specimen of the *Quina amarilla fina del Rey*. This was part of a large importation recently arrived from Payta (the port of Loxa) and was pointed out to me as particularly fine bark. It has been compared by Dr. Pereira and myself with the sample of the above bark in the Museum, and found to coincide with this old and highly valued species. The quills are longer, more smooth, and of a much lighter colour than those of the Uritusinga, and coincide in every particular with the description given by Laubert§ of the *casarilla amarilla*, *casarilla de Loxa*, or *cinchona legitima* of Ruiz. It appears that this species was examined by Tafalla, and a drawing made carefully under his inspection, which was to have appeared in a fourth volume of the *Flora Peruviana*. Ruiz, in the *Quinolugia*, considers it a simple variety of the *Condaminea*. "The colour of the internal surface, when recently stripped from the tree, is of a greenish white, which soon changes to a feeble yellow, and augments in intensity until it is entirely dry." In this property it agrees with the *colorada*, which, "at the time it is peeled from the tree, takes on the inner surface the colour of saffron, but rather livid, whilst in its becoming dry its colour deepens and approaches more or less that of Ceylon cinnamon." This depends, no doubt, on the effect of oxygen upon the peculiar modification of colouring matter which pervades the plant; and in the bark under consideration the substance, when recently exposed to view, is of a pale yellow, or almost white, colour, as is well remarked

† Lambert, *Ill.*, p. 86.

‡ Spelt in one place *Ynta*.

§ *Bulletin de Pharmacie*, ii., p. 292, et sequent.

by M. Guibourt when describing the *Quinquina jaune de la Condamine*,† which I take to be the same bark.

M. Guibourt says of this *quinquina* that it is almost the only sort which is now found in French commerce as *Loxa*. In our market it forms one of the finest and most esteemed kinds, but it is looked upon as verging rather more upon the "rusty crown" than the "silver crown" bark. It comes, I understand, not unfrequently, but I have not yet been able to examine it in reference to the alkaloids contained.

The *amarilla Uritusinga* has (so far as I can learn) almost disappeared from commerce; but the Pharmaceutical Society possesses an excellent specimen in the collection of Dr. Pereira. This (as was the case with the parcel I examined) has been tied up in a bundle by means of bass—a practice which the *cascarilleros* still resort to when they meet with any bark they esteem peculiarly good. It is the *Quina selectissima* of Delessert. I see also, in referring to the 4me ed. of M. Guibourt's *Histoire*‡, that M. G. describes this bark as *Quinquina de Lima tres rugueux imitant le calisaya*.

The *grey brown* should, perhaps, rather be the *rusty brown* variety. This (which is, as I conclude, the *knotty* of M. Jussieu), the *chaharquera* of Pavon, proves, on careful examination by Dr. Pereira and myself, to be the *rusty crown* bark of commerce, and also *certainly* the *huamalties* or *rusty bark* of Bergen. This identification, which was suggested by Dr. Pereira on inspecting the samples of Pavon, was entirely confirmed by reference to the specimens of Von Bergen's *huamalties* in the Pharmaceutical Society's collection. I had previously noticed the strong analogy, chemically and physically, which exists between this kind of bark and others which I refer to varieties of *Condaminea*. The origin of this bark has been referred to the *C. purpurea* of Ruiz and Pavon; but there are excellent specimens of this bark in the collection of Pavon, which bear no sort of analogy to the *huamalties* of Bergen, though they coincide with those of *C. pubescens*, var. 7, *purpurea* of Weddell.

The explanation of this disagreement is, perhaps, to be found in the fact that the *huamalties* was sent over as a *mixed bark*, "all sorts mixed together, rusty." It could not then be ascertained as the produce of any one tree. Our identification is with specimens of Von Bergen, and with the plate and description of Goebel. This *huamalties* bark is fully described in Pereira's *Elements of Materia Medica*. Another bark of recent introduction, called here *Carabaya* bark, frequently contains pieces of what is called in Germany *huamalties*. The characteristics of the *huamalties* bark of Bergen should rather lead to its being classed with the red barks of commerce. The *Carabaya* bark is the produce of *C. ovata*, according to Dr. Weddell, who assured me positively of this whilst examining the specimens. The origin is also given in his *Histoire*, &c.

The *cascarilla fina de Loxa* has also been represented in recent importations. Dr. Pereira and I found thirteen chests, out of a sale of 613 packages from Payta and Lima, to be of this character. The *silver crown* and *leopard crown* varieties formed a considerable proportion of some chests, giving thus a connection with the *Condaminea* of Humboldt; for a botanical specimen brought home by Seemann, which agreed with the plate of Humboldt, was accompanied by bark peeled off the same branch, and this proved to be exactly *silver crown* bark. The remainder of the chests were *fine old Loxa*, resembling that in the Museum under the above title, not so heavy nor quite so rough as the *Uritusinga*, but approaching the character of this variety.

The *black* or *quina negra* sorts have been brought in larger quantities. These are evidently inferior barks, the produce of Weddell's *β Candollii*. It is the *Quinquina de Loxa brun compacte* of Guibourt.

The *fibrous orange red* was represented by the *estoposa* bark, of which I found two serons entire, and others mingled with *ashy crown*, in the importation mentioned above.

† *H. D.*, 4me edit., p. 106.

‡ *Idem*, p. 112.

Commercial red bark was mingled with a portion of the same importation coming from *Payta*, though the usual port for this bark is Guayaquil. Riobamba and Cuenca in the districts bordering on Guayaquil, and Jaen further south, are mentioned by Laubert as the places where this bark was believed to be first discovered. I can scarcely think that it does not grow also at Loxa, which is intermediate between these places, and certainly one of Pavon's specimens of *colorada* (as mentioned above) would pass as such in commerce.

(To be continued.)

ON COCCUS ILICIS.

BY DR. X. LANDERER.

The *Coccinella septempunctata*, is known in the east by the name *Κρεμνίς*, and the *Coccus Ilcis* by that of *Πρινόκοκκος*, the tree on which the latter insect is found, and from which it is collected, being called by the Greeks *Prinos*, that is, the *Quercus coccifera*. As this tree occurs abundantly in Greece, and principally in the mountainous parts, these insects are also found here, but it is only in Peloponnesus, and almost exclusively in the neighbourhood of Messena, that the inhabitants collect them. The insects are found adhering to the bark of the branches of this tree, and also immediately above the root, but very rarely on the leaves, and it is observed that those found near the roots of the tree are larger, and contain more colouring matter than the others. An active man may collect from six to ten ounces in a day. With the view of increasing the number of these insects, the people burn the small trees on the mountains, and in consequence of this bad management, sometimes set fire to whole forests. The ashes appear to fertilize the ground, and to be very favourable to the growth of the trees on which the insects are found. The *Coccus* looks like a small egg, which can hardly be distinguished on the young branches, to which it is attached by an envelope. In about three months it acquires the size of a pea. If the insects are not collected at the proper time, that is, about the middle of June, they burst the envelope and escape, leaving only the envelope, which is valueless, as it contains none of the colouring matter. The collectors cut off the branches on which the insects are found, with a hooked knife, which is made for the purpose, and afterwards separate the insects, which, still mixed with some of the leaves and flowers of the trees, constitute the first rough article of commerce. They are immediately exposed to the sun on sieves, by which means they are killed and preserved. The size varies according to the vigour of the trees from which they have derived their nourishment. After being dried, the insects are separated from the leaves and other foreign matters with which they were mixed, and packed in small casks, in which they are transmitted to Marseilles, Malta, &c. The principal consumption of them is in the east, where they constitute the principal material used for colouring the red head-dresses used by the men in these countries. In order to increase the weight of the insects, they are sometimes sprinkled with red lead, which fills up any cavities, and red sandal-wood, and pea-flour coloured with a decoction of the insect, are also used for the same purpose. I have been assured by dealers in the article, that three or four per cent. of such adulterations may be added, without their being easily detected. The insects collected in the above-named localities, are considered to be of better quality than those obtained from other parts. About 40,000 pounds weight of them are annually collected in Greece. Those of the best quality sell at from 20 to 30 drachmas per pound. There is an inferior quality, which is sometimes exported in powder, but as this is more or less adulterated, there is little demand for it. This rarely finds its way into European commerce, but is generally sent to Tunis, where it is used with madder for dyeing the red turbans or head-dresses, of which great quantities are sent from Tunis to all parts of the East, and it is said that the colour produced at Tunis is more durable than that pro-

duced by the Greeks. I have only to add, with regard to the medicinal use of these insects, that they are employed as a remedy for different diseases, especially scarlatina, and that they are administered in the form of infusion and of electuary.

ON THE MODE OF ASCERTAINING THE PURITY OF ESSENTIAL OIL OF BITTER ALMONDS.

BY MR. JOSEPHUS FERRIS.

It is advantageous to all upright manufacturers that tests of purity should be known to all dealers in, and consumers of, those articles they manufacture. I feel, therefore, assured that Mr. Redwood's report, contained in your Journal of last month, "On the Mode of ascertaining the Purity of Essential Oil of Bitter Almonds," will be received generally with satisfaction. From that report I ascertain the following facts, viz. :

1st. That *strong* nitric acid will detect the presence in essential oil of almonds of the very minutest quantity of spirit.

2nd. That the hyduret of benzoyle, which is the true oil of bitter almonds, and ought to constitute about 85 or 90 per cent. of the crude oil, is a colourless transparent liquid, the specific gravity of which is 1.043.

3rd. That on adding oil of vitriol to the lighter oil, it produces a reddish-brown colour, *similar to that afforded by pure hyduret of benzoyle*, whilst the heavier oil formed a bright red mixture, the purity and intensity of which colour could hardly be surpassed.

4th. That essential oil of bitter almonds (free from adulteration), about the specific gravity of 1.052, is preferable to that of a higher specific gravity.

To this, permit me to add the following remarks :—

The test of strong nitric acid is valuable, inasmuch as it is simple and effectual in detecting the presence of alcohol, which is, I believe, the only adulteration applicable to essential oil of bitter almonds; and as regards the use of salt, I have demonstrated by actual experiment that it is a very powerful agent in increasing the specific gravity, and is productive of that splendid red colour referred to in the report, and is the cause of the deposit of a blood-red matter in essential oil of bitter almonds, so often complained of by wholesale Druggists, and which cannot take place in purer lighter oil. In conclusion, it is not unimportant to consumers of essential oil of bitter almonds, or to retailers (who frequently purchase by weight, and sell by measure), that if a Winchester quart holds 6 lbs. of oil, sp. gr. 1052, it will contain 6 lbs. 2½ ozs. of the oil of sp. gr. 1082.

Should either of these statements be doubted, I am willing to abide the decision of Mr. Redwood, than whom, I presume, a more competent or faithful referee cannot be found.

36 & 39, Great Sutton Street, May 13, 1852.

ON MATERIALS THE BEST ADAPTED FOR FILLING THE TEETH.

BY WILLIAM ROBERTSON, ESQ.

THE existing cause of what has been termed decay of the teeth, has long ceased to be a disputed question.

In July, 1835, when the first edition of my work was published*, the subject of controversy was, whether the *cause* of the destruction of the teeth be attributable to inflammatory action, or to chemical agency. This is no longer a question of dispute, for it is admitted by every practical and intelligent member of our profession, that the destruction of the teeth is occasioned by chemical agency, and *not* by inflammatory action.

We clearly perceive that the attack upon the teeth is always made *from without*,

* The work has arrived at a fifth edition.

and never from within; and that the mischief never begins upon the smooth and level parts of the tooth, but we find that it always commences in pits, fissures, and interstices upon their surfaces, receptacles where the more liquid portions of the food are admitted and retained until decomposition takes place. The deposit having undergone this change, it acquires a property and a power similar to an acid, of acting upon the phosphate of lime and animal matter, the two substances of which the teeth are composed. The result of this action is the destruction of the power of cohesion which previously existed between these particles; consequently the structure becomes changed from a state of crystallization into its component parts.

That this is the real cause of the destruction of the teeth, is clearly evinced from the nature of the operations which have so long been proved to be effectual in remedying the evil. For instance, in using the file, our object is to remove the cavity or resting-place where the food was retained, and by thus making a plane and smooth surface, no future lodgment can take place, and the mischief is arrested. Again, in filling the teeth, the object and principle is the same as in filing them, for the destructive matter is removed from its resting-place, and permanently excluded by filling up the cavity firmly and securely with a durable substance, incapable of injuring the structure of the tooth. The consideration then is, what substances are the best adapted for this purpose?

Pure and well-prepared gold leaf is undoubtedly the best and the most durable material which has yet been discovered for filling the teeth, and particularly so when the operation is performed in the early stages of decay, and before the slightest tenderness has been felt in the tooth. I should therefore recommend gold to be used in all cases where it is practicable, in preference to any other filling. But we have numerous cases which present themselves where gold cannot be used, and where an amalgam becomes a necessary substitute.

It too often happens that filling is neglected until decay has made considerable progress. The cavity having become large, the surrounding walls thin, and the tooth so tender as not to admit of the pressure necessary to condense the gold into a secure and solid plug, without the risk of producing pain or splitting the tooth.

There are also various cases arising from the position of the decayed parts, and the shallowness or saucer-shaped form of the cavity, where a gold filling would not remain, and where it becomes necessary to use an amalgam. The consideration then is, what materials are the best to form this amalgam?

I have given much time and labour to the investigation of this subject, and after numerous experiments with the various metals, have come to the conclusion that gold, silver, platina, and tin, in their pure state, are the best; because I have found in using them, either separately or combined, that they resist the acids of the mouth better than any of the other metals.

An amalgam of these, however, cannot be formed without mercury, but the smaller the portion the better, so that there shall be just sufficient to unite and hold in permanent combination the purer metals above specified.

The amalgams in general use, even those of the better class, which are composed of the metals above mentioned, contain a great deal too much mercury; and I shall presently show that the cause for this superabundance of mercury arises from the incorrect proportioning of the metals, and the improper mode of mixing them. The method generally adopted in preparing an amalgam is to combine the mercury at once with the other metals, so that the compound may be ready for using, and when a portion is required it has to undergo a process of heating and rubbing, to bring it back from its crystallized form to a pasty state before putting it into the tooth. Instead of adopting this method, the mercury ought to be kept separate from the other metals, and only mixed with them at the time of using. This mode of mixing, with the metals rightly proportioned, will produce a harder and more durable filling, and the metals will combine with *one-third* of the mercury required in the former mode of preparing the amalgam.

As an illustration of this fact, even in the better class of amalgams, I may refer to a paper that appeared in the *Pharmaceutical Journal* for March, 1850, on *Amalgams for Stopping the Teeth*, by Arnold Rogers, Esq. "I have much pleasure," he says, "in communicating, through the Pharmaceutical Society, a few remarks on amalgams, as well as the formula for the one I have used for some years, and though occasionally some specimens have come under my observation which seemed to possess qualities superior to the general character of amalgams, yet, on the whole, I have been satisfied with my own compound. Not but that I think it may be improved

upon, and, when leisure time will allow me, I shall endeavour to profit by the hints and communications of my professional brethren."

After a few remarks on various amalgams, Mr. Rogers proceeds to point out the method of preparing his own. And first, an amalgam is composed of silver one part and mercury four parts. This amalgam of silver is to be united with an amalgam of gold, which consists of gold one part and mercury three parts. These are to be kept in separate boxes, and when used the proportions are to be two parts by weight of the gold amalgam to one of the silver: thus making the amalgams, when combined, to consist of silver one part, gold two parts, and *mercury two parts*. Then as to the manner of using it. "The two pellets had better be triturated thoroughly in a mortar before the compound is submitted to the flame of a spirit-lamp; and I have observed," he says, "that for the better incorporation, it is necessary to submit to heating and trituration in the usual way three or four times. The cavity of the tooth being quite prepared for the reception of the amalgam, all the mercury that can be pressed out between the thumb and fingers should be so separated, and the compound immediately packed in the cavity."

Now I feel persuaded that Mr. Rogers will agree with me as to the desirability of getting rid of a portion of that mercury, and I shall presently show that by using the same metals with the addition of another metal, and by proportioning them, and by preparing the amalgam differently, we shall be enabled to dispense with *seven parts of this mercury out of the ten*.

Some dentists use an amalgam of palladium and mercury, which makes a firm and durable filling, but it becomes black in the tooth. A few years ago cadmium was introduced as a filling, and for a short time it promised well, and appeared to be an improvement upon former amalgams, but after a few months' trial it showed its defects, and has very properly been discarded. It neither retained its colour nor its hardness, for when acted upon by the friction of the opposing teeth it soon wore away, and when not acted upon it became, in parts, yellow as saffron, with the disadvantage also of having a strange tendency to produce galvanic action in the mouth. Objectionable as this compound is, it still continues to be used by a certain class of practitioners, under the title of "Parisian filling." There are various kinds of amalgams used by the same class of individuals, which contain copper, lead, bismuth, zinc, and antimony, all of which are injurious. To test an amalgam properly is a work of time—a few months is not sufficient—years of observation are required to ascertain its real character and to judge of its utility. Its introduction to the public ought, therefore, to be the act of an experienced member of the profession, for it becomes rather a serious matter if we find that the filling we may have been using pretty freely for six or twelve months, upon the strength of another's recommendation, should result, like the cadmium preparation, in a complete failure.

The amalgam which I am about to describe contains nothing novel so far as the materials are concerned. There are no new metals introduced; they have all been used, in different forms, for many years, but it is in the proportioning of them, and by a different mode of preparing the compound, that I have been enabled, of late years, to get rid of two parts out of the three of the mercury formerly required; and this I consider to be an important advantage, for, as I have before said, an amalgam cannot be formed without mercury, but the smaller the portion required of this the better.

Since making this change, I have had ample time (upwards of three years) to test the merits of the compound, and can, therefore, speak practically of its utility.

The amalgam consists of gold, one part; silver, three parts; and tin, two parts, and it is of the utmost importance that the metals should be pure, free from the smallest particle of alloy.

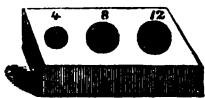
The mode of uniting the metals, is, first, to put the gold and silver into the crucible, and just as they are at the point of melting, add the tin, which requires less heat than the former metals. When they become melted, but not over-heated, pour them from the crucible, melt them a second time, for the purpose of having them properly mixed, and then pour them into an ingot of a shape the best adapted for reducing the compound into the finest powder.

The mercury is to be kept apart from the powder, and mixed with it at the moment the amalgam is to be put into the tooth. The mercury must be perfectly pure, and the quantity required will be equal in weight to the powder; and here, it

will be perceived, we get rid of seven parts of the mercury out of the ten before mentioned.

In mixing the powder with the mercury, the exact proportions of each can be ascertained to the greatest nicety, and by a very simple process, which will save time and materials, and which makes a harder compound, than by using a larger portion of mercury, and squeezing part of it out again.

A measure for the mercury may be made from a square portion of ivory, by drilling in it three holes; one may be made to contain four grains, the second eight grains, and the third twelve grains. The mercury to be poured into any one of these, as more or less may be required to fill the cavity of the tooth, and by drawing the finger across, so as to bring the mercury on a level with the surface of the ivory, the portion wanted may be accurately obtained.



The measure for the powder is equally simple and convenient. It is a metal tube, with a handle attached, calculated to hold four grains, which is also got to a nicety by filling, and then drawing the finger across the mouth of the tube, so as to make level measure.



The mercury should be kept in a small bottle, with an India-rubber tube attached to its neck, and the mercury is readily passed through the tube into the measure. In this way, the exact quantity of each of the metals is readily obtained.

The powder and mercury to be emptied from the measures into a small glass mortar, and rubbed till they become mixed. The compound is then to be rubbed firmly with the finger in the hollow of the hand, till converted into a paste, which, before hardening, allows plenty of time for insertion into the cavity of the tooth.

I have found this compound to be far superior to the former class of amalgams. It does not, like palladium, and some of the other metals that have been used, become black in the mouth. It retains its hardness and firmness, and is not, like the cadmium, liable to be worn away by the friction of the teeth.

Formerly, in fixing artificial teeth upon a gold plate, it was necessary to avoid bringing the gold in contact with a tooth filled with amalgam, because a portion of the mercury united with the gold and injured it. This evil is now remedied by the compound containing so small a quantity of mercury, which is held in permanent combination with the other metals, so that not a particle of it is abstracted by the embrace of a gold clasp. With these important improvements upon former amalgams another advantage is, that it is used with much greater facility.

From experiments which I have made during the last twelve months, I find that the portion of mercury which I have named can be reduced still further, and which I believe will be an improvement upon the present compound; but, as I have before stated, more time and practical experience to test the result of even this alteration, is desirable, before taking the responsibility of giving it to the profession.

The Square, Birmingham, May 16th, 1852.

ON THE COMMERCIAL MANUFACTURE OF SULPHATE OF IRON.

THERE is perhaps no article in the wide range of chemical manufactures which occurs so much in the form of a bye-product as sulphate of iron.

It may, however, be obtained by the direct action of sulphuric acid or metallic iron, in which case the acid employed should be about the sp. grav. of 1.21. Wooden vats lined with lead are used in this manufacture; their length may be about nine feet by four feet wide, and three feet deep, in which a larger quantity of iron is placed than can be readily saturated. On the iron, sulphuric acid is poured, of the specific gravity above mentioned, until the vats are about two-thirds full. Steam is then blown in through a lead-pipe about one inch in diameter, and when the specific gravity of the solution has reached 1.261 to 1.283, the liquor is run off through leaden syphons into the crystallizing vessels. The resulting mother-liquors may be used in the next operation, with the addition of strong acid in sufficient quantity to mark about 1.270. About 2646 lbs. are obtained by the employment of that weight of acid in the first operation.

Another source of sulphate of iron, is the pickle-pot liquor of the tin-plate manufacturers. The pickle employed, is dilute sulphuric acid, into which the plates

of sheet-iron are dipped, previous to their immersion in the melted tin with which their surfaces are to be coated. When the pickle has become too weak to act on the oxide coating the surface of the iron plates, scraps of old iron are added to neutralize the remaining portion of acid in the liquor, which is then evaporated to a suitable density, and set aside to crystallize.

Another method, is that of Mr. Gregson, which consists in dissolving silicate of iron in sulphuric acid. Into a shallow vessel lined with lead, and capable of holding about 50 gallons, 100lbs. of the slag produced in the balling furnaces of iron works (which is a compound of silica and oxide of iron) is put, being first finely powdered, and made into a thin paste with water; to this, 100 lbs. of sulphuric acid of commerce, of the specific gravity 1.845, previously diluted with its own weight of water, is added, the mixture being well stirred during the addition of the sulphuric acid. The sulphuric acid combines rapidly with the oxide of iron, with the production of much heat, and when cold, a solid mass of impure sulphate of iron is obtained.

This is dissolved in its own weight of water, and the solution allowed to stand till clear, after which it is drawn off, evaporated and crystallized in the usual manner. In this process, the action is very rapid, but from some hitherto unexplained difficulties attending the crystallization of the sulphate of iron thus formed, it is employed only in the manufacture of Venetian red.

Large quantities of sulphate of iron are manufactured in conjunction with alum. The alum shale is a kind of clay slate found at Whitby, in Yorkshire, and at Hurlet and Campsie, in Lanarkshire. This shale contains variable proportions of alumina and iron pyrites (bisulphuret of iron); indeed, the different beds in the same working yield a shale varying much in composition, so that a little management is required in regulating the admixture of the shales, so as to obtain the best results.

The above manufacture can no more dispense with the use of pyrites than of alumina, the former being a necessary ingredient in the production of alum. This is equally the case, whether the shale is treated by exposure to air or by roasting. In the case of exposure in heaps to the air, a portion of the sulphur of the pyrites absorbing oxygen from the air, becomes converted into sulphuric acid, part of which reacts on the alumina, and part on the oxide of iron, also formed, with the production of sulphate of alumina and sulphate of iron, whilst in the case of roasting the shale, the pyrites is decomposed, and sulphate of iron and sulphate of alumina are formed, as in the other case.

The product both of exposure or of roasting is then lixiviated with water. The crude liquor thus obtained varies as to the relative proportions of sulphate of iron and sulphate of alumina contained in it. If sulphate of iron be in excess, the liquor is treated with old iron, and the sulphate crystallized out, the process being facilitated by suspending rods in the solution to serve as points of attachment for the crystals.

If alum be in excess, the solution is treated with sulphate of potash or sulphate of ammonia, according as potash or ammonia alum may be required, and the alum crystallized, after which, the mother-liquors are treated according to the nature of their contents. If they consist chiefly of acid solutions of persulphate and protosulphate of iron, old iron is added, the liquor is concentrated, and crystals of protosulphate of iron obtained; if they contain excess of chloride of iron, they are boiled down and converted into Venetian red by heating the product to redness.

Another source of sulphate of iron is what are technically termed "copperas beds." These beds are formed of layers of shale or coal, in which large quantities of iron pyrites (bisulphuret of iron) are interspersed. On exposure for a considerable period to air and moisture, spontaneous decomposition takes place; the sulphur of the pyrites absorbs oxygen from the air, and becomes converted into sulphuric acid, whilst the iron also at the same time acquires the state of oxide; the sulphuric acid and the oxide of iron react on each other with the formation of sulphate of the protoxide of iron, which drains off in the state of solution into suitable receivers, where it is further treated, if necessary, with old scrap iron, then evaporated, and set aside to crystallize. In dry weather, the beds are watered to facilitate the decomposing action, and the carrying off of the sulphate of iron formed.

There are some kinds of pyrites which are not susceptible of spontaneous decomposition by exposure; these are first roasted either in close vessels or in contact with the air of the atmosphere. In the former case, the sulphur obtained is directly employed in the manufacture of sulphuric acid, the residuum being a protosulphuret of iron amounting to about seven-eighths of the pyrites burnt. In the latter case, the sulphur is driven off with formation of sulphurous acid and protosulphuret of

iron, with more or less sulphate as a residuum. The protosulphuret, as above obtained, may then be exposed to the decomposing influence of the atmosphere, or it may be digested in dilute sulphuric acid, thus forming another source of sulphate of iron. For this purpose, the roasted pyrites is placed in stone or wooden cisterns lined with lead, and sulphuric acid added of the specific gravity 1.30, so as to cover the mass; heat is then applied by steam or other means, until the temperature ranges from 160° to 200° Fahr., care being taken to avoid ebullition. In about six hours, or when the solution has reached the specific gravity 1.35 or 1.40, it is drawn off, and a fresh portion of dilute acid is added; this is heated as before, then drawn off. This process is repeated six or seven times, after which there will be found in the cistern a quantity of free sulphur, which may be collected and used in the manufacture of sulphuric acid. The solution, as it is drawn off, is run into coolers to crystallize, it being found, that by the use of acid of the above specific gravity, no evaporation is required, thereby effecting a great saving of time and labour. The mother-liquor is used to dilute a fresh portion of sulphuric acid.

Mr. Goswage's mode of obtaining sulphate of iron is as follows:—Powdered burnt pyrites is mixed with one-fifth its weight of raw pyrites, and a sufficient quantity of moistened clay to form a cohesive mass, which is divided into balls about half the size of a man's hand; these are dried and then burnt in kilns of a similar construction to those employed in the manufacture of sulphuric acid from pyrites. The kiln is first heated to a suitable degree by means of burning fuel introduced therein, on which the dried balls and some coke or small coal is placed, the proportions of the latter being so regulated as to afford sufficient fuel to obtain a red heat. When this operation is completed, which usually requires about six hours, the balls are withdrawn, and the product is lixiviated with water containing 8 parts of sulphuric acid to each 100 parts of balls. A solution is thus obtained, containing protosulphate of iron, persulphate of iron, and sulphate of copper; the copper is separated by means of metallic iron, and the residuary solution, when concentrated by evaporation, yields crystals of sulphate of iron.

There are two other sources from which large quantities of sulphate of iron are obtained as a bye-product; these are from the infiltrated waters of copper mines, and also from the treatment of copper ores (sulphurets of copper) for the purpose of obtaining therefrom metallic copper without the process of smelting, and at the same time utilizing the sulphur which, in the smelting process, is for the most part dissipated. In the former of these cases the sulphur of the copper ores in the mine which come within the combined sphere of air and moisture, becomes converted into sulphuric acid, and the metal by the same agency is changed into oxide; the sulphuric acid reacts on the oxide of copper, and the infiltrated water of the mine dissolves the sulphate of copper thus formed. This solution of sulphate is collected in large reservoirs, in which are immersed pieces of scrap iron; the sulphuric acid leaves the copper, which then precipitates in the metallic state, and combines with an equivalent of iron forming sulphate of that metal, which remaining in solution, is evaporated and crystallized.

At various depths in the mass of the metalliferous clay-slate district in Wicklow, there occur beds of what is technically termed *soft ground*, which consists of decomposed slate of various tints, abounding in particles of pyrites of iron, and sometimes copper and arsenic, and usually accompanied by a considerable body of greyish or yellowish-white clay. When brought to the surface and exposed to the action of the air, these bodies rapidly decompose, and, absorbing oxygen, form alum, sulphate of iron, and sulphate of copper. A similar drainage takes place under ground, and hence the drainage water of the district contains a very sensible quantity of copper, which is economized by conveying the water as well from the lower as from the upper mines into tanks, where the muddy particles are allowed to subside. The clear water is then run into pits containing scrap iron, which causes the precipitation of the copper, and dissolves in its place with the formation of sulphate of iron.

This process is, however, in practice, attended with many disadvantages, the chief of which is, the great destruction of iron resulting from the existence of that metal originally in the waters in the state of a persulphate, which salt has the property of dissolving almost all metals, so that by its reaction upon the iron used to precipitate the copper, much loss is occasioned. To prevent this loss, and at the same time to obtain a larger quantity of copper than was usually obtained, and in a purer state, and to convert the iron originally held in solution into sulphate of that metal, Mr. Napier suggested the following improvements:—

The water to be operated upon being collected in a tank, sulphuric acid is added in the proportion of about one pound thereof to fifty gallons of water, and the requisite quantity of old iron is put in; in the course of a few hours the water is completely exhausted of copper, and is then drawn off with the precipitated copper, with a filter of sponge, cloth, or other suitable material, which retains the copper; the protosulphate of iron in solution passes through the filter, and is afterwards evaporated and crystallized.

To reduce the persulphate of iron to a protosulphate, sawdust is thrown into the tank containing the water (in the proportion of one pound thereof to fifty gallons of water) at the same time that the sulphuric acid and iron are added. Other vegetable matters will also produce the same effect as sawdust, as will also the soluble portion of the refuse lime from gas works.

In the other case, as in Mr. Bankhart's process, the conversion of the sulphur contained in the ores of copper into sulphuric acid, and its consequent reaction on the oxide of copper formed, is effected by carefully wasting the ores with free access of atmospheric air. By lixiviation the residue yields sulphate of copper, which, when subjected to the action of metallic iron in the way above mentioned, produces metallic copper and sulphate of iron.

ON OXIDE OF ZINC.

BY DR. WITTSTEIN.

MOHR (*Archiv der Pharmacie*, lkv., 137) has found that a full red heat is not essential for the complete separation of carbonic acid and water from the carbonate of zinc, but that a temperature of from 280° to 300° C. ($\approx 536^{\circ}$ to 572° Fahr.) suffices for their speedy and perfect expulsion. The operation can be performed in an uncoated glass alembic or porcelain dish. The preparation undergoes no change of colour thereby (i. e., it remains perfectly white, whereas, the over-heated oxide shows a trace of yellow). We now observe that it has become very mobile, and no longer adheres to the capsule, but floats on a layer of carbonic acid and aqueous vapour.

If a glass flask be used, it must be half filled with finely pulverized* carbonate of zinc, and placed on a triangle not too near a gentle coal fire. As soon as condensation of watery vapour takes place in the neck of the flask, this is to be stopped with a piece of cloth, and gently shaken in a circular direction. Thereby those parts at the lower surface of the flask are mixed with the rest of the powder, and other portions are transferred to the fundus of the flask, while the aqueous vapour is more quickly and abundantly disengaged and deposited on the neck. In order to remove this the more readily, a pair of small hand-bellows may be employed for the purpose of gently blowing into the neck of the flask. After repeated shaking the process is terminated. Its completion may be known by the circumstance of the powder no longer floating, as it were, on the surface of the stratum of vapour, but subsiding to the bottom of the vessel. A proof of the absence of carbonic acid may be found by placing the powder in a porcelain dish, and repeating the operation with a fresh quantity.†

The experiment and testing are more easily performed in a porcelain dish, as the shaking can therein be more exactly regulated. If the temperature be raised too high, the powder will be burnt yellow even under a red heat. This observation of the yellow discolouration from a pure white by irregularity of the heat, has led Dr. Wittstein to the consideration of the question, often discussed, of the cause of the yellow colour of oxide of zinc prepared in the moist way. For this purpose he has instituted a series of experiments, and has shown, among other conclusions, that the adhering sulphate or alkali exerts an essential influence, although at present the question cannot be fully answered.

Under these circumstances a theory is advanced by the author which may be considered as not entirely absurd. We know that the estimate of the colour of a body is different according as it is in a state of minute division, or in that of a compact solid form. Thus brown iron ore gives a dirty yellow powder; and a brownish piece of gum Arabic will produce a perfectly white powder; and so forth. It is

* This condition is essential to the success of the operation.

† In the same manner, Mohr converts carbonate of magnesia into pure magnesia.

extremely seldom that the reverse is noticed, viz., that the powder is darker than the mass; such is the case with the colourless diamond, which gives an ash-grey powder. The author is of opinion that the change of white oxide of zinc to that of a yellowish white, from increase of temperature, may probably be owing to a change in the state of its molecules, somewhat resembling that of incipient fusion; and he hoped to have been able to have determined this point by the help of the microscope.

With this view a portion of carbonate of zinc, which had been ascertained by the usual tests to be free from any trace of iron or other metallic impurity, was placed in a porcelain dish over a spirit-lamp, and constantly stirred until it became so hot that a test-portion added to dilute sulphuric acid gave off no bubbles of gas—a point which speedily occurs. This preparation had the same snow-white colour as the pure carbonate. Placed under a microscope, having a magnifying power of one hundred and twenty, the separate particles of the powder were easily observed; under this power they appeared as globules of about the size of pins' heads, frequently smaller, seldom larger, never exceeding $\frac{1}{150}$ th of a line in diameter: their form was changed by moisture. The parts that were moistened were distinguished from the surrounding powder by a distinct pale yellow colour.

The oxide was now heated for a quarter of an hour; when quite cold it was no longer of snowy white but milk white; the difference could readily be appreciated by a comparison with the pure oxide. Magnified a hundred and twenty times, the particles appeared opaque, smaller than before, and often arranged in a string-like form. There were also observable numerous yellowish-brown particles dispersed among the yellowish-white mass. When magnified three hundred times the globules were transparent—the oxide remained the same after it had been heated half an hour, one hour, and two hours. Between a quarter of an hour and two hours the oxide undergoes absolutely no change, neither to the naked nor to the assisted eye.

The author considers that he has thus made an approach towards the solution of this riddle, although the above theory should not be confirmed or should even be controverted. There can be no doubt that the yellow discolouration retained by the oxide after cooling is owing to the yellowish-brown particles scattered throughout the mass. It still remains to discover the nature of these granules in order to answer this long-debated question of the cause of the yellow colour of the oxide of zinc prepared by heat.

It has been above observed that the carbonate of zinc operated upon had been found pure by the usual reagents. By testing it was examined for iron, lead, cadmium, and copper; the acidulated solution of the hydrochlorate with sulphocyanuret of potassium, and hydrosulphuric acid, were added without producing any result. Possibly manganese might be present, which in only slight traces, it is well known, is not easily detected. In the burnt oxide, manganese must be present in the state of oxyduloxide; if, therefore, this be converted into a muriate, chlorine must be present, and this will exert a solvent action on gold-leaf simultaneously exposed to its influence; faint traces of gold in solution may be indicated by chloride of tin, and the author trusts that in the cases of the presence of manganese that he may obtain a decisive reaction. At first the muriatic acid employed, with a possible admixture of free chlorine, was tested by digestion with gold-leaf, but with negative results. In the next place, one loth (equal to half an ounce) of the burnt oxide of zinc was dissolved in the same hydrochloric acid which contained gold; and the vessel being closed by a glass stopper was set on one side for twenty-four hours. Chloride of tin produced no change in the solution, even after several hours' exposure to the action of warmth. Dr. Wittstein employed also a very sensitive test for manganese, first proposed by Crum, and which he has himself frequently found useful, viz., a solution of the oxide in nitric acid, to which is added a small quantity of the brown binocide of lead, heat being applied; manganese being present, hypermanganic acid is formed, and the fluid becomes reddened. By this test, however, no manganese was discovered, and the author therefore concluded that the oxide of zinc was free also from this impurity.

Dr. Wittstein repeated his experiments for the detection of other metals, upon larger quantities of the oxide, as in his earlier researches. Half an ounce was dissolved in excess of hydrochloric acid, and hydrosulphuric acid passed through the solution for a long time—it produced not the slightest disturbance. Again, half an ounce of the oxide was dissolved in hydrochloric acid, which had not shown any change on the addition of sulphocyanuret of potassium, and on the then employment

of this reagent, a faint red discolouration showed the presence of slight traces of iron. The extraneous admixture, which was shown to be present by the aid of the microscope, consists also of oxide of iron, but in such minute quantity, that of all its tests the sulphocyanuret of potassium alone manifested its presence.

From all the preceding, the author considers it fair to infer, that when the oxide of zinc, after being heated, acquires a yellowish tint, it proceeds from the presence of a slight trace of oxide of iron. Clearly, however, no explanation is hereby furnished of the cause of the citron-yellow colour of oxide of zinc which attends its heated condition and disappears on cooling. This phenomenon is purely physical, and must be classed with numerous similar phenomena, *e.g.*, the blackening of oxide of mercury by heat, and so forth.—*Vierteljahresschrift für praktische Pharmacie*, 1852.

NOTE ON PICRIC ACID CONSIDERED AS A YELLOW COLOURING MATTER.

BY M. J. GIRARDIN.

M. GUINON, a clever dyer, residing at Lyons, was the first to apply, in the dyeing of silks, the property possessed by picric acid, namely, that of producing on the skin a fine, solid yellow colour. The trials he made of it were completely successful, and since July, 1847, he has largely employed this artificial acid in order to obtain in the dyeing of silk yellow of different shades, from light yellow to sulphur or pale lemon colour. At the exposition of the products of industry in 1849, we admired those tissues dyed by him by means of this new agent. He has subsequently published a note on the preparation of this acid, and its application to dyeing yellow.

Picric acid, the discovery of which Berzelius attributes to Hausmann (1788), is the yellow and bitter acid product formed in the reaction of nitric acid on a large number of organic substances, azotized or not, such as, amongst others, silk, aloes, indigo, salicine, hydruret of salicylic acid, coumarine, oil of tar, &c. It has successively been known in science under the names of *bitter yellow*, *welter bitter*, *indigo bitter*, *amer au maximum* (Chevreul), *bitter acid*, *carboazotic acid* (Liebig), *nitropicric acid* (Berzelius), *nitrophenilic acid* (Laurent), *trinitrophenic acid*, and *trinitrophenate* (Gerhardt). M. Thénard has given it the name of *picric acid*, from *πικρος*, bitter, to indicate its marked bitter flavour. MM. Dumas and Laurent represent it by the formula $C_{12}H_6N_6O_{14}$.

The least expensive process for obtaining this product in large quantities, is that made known in 1841 by M. Laurent, and which consists in making twelve parts of ordinary nitric acid react on ten parts of oil of tar, of oil of coal, or of hydrate of phenyle. The following is the manner in which M. Guinon performs this process for the requirements of his workmen:—

"In a capsule or stone pan, the capacity of which should be at least triple that of the matter employed, there is first put three parts of commercial nitric acid at 36° , the temperature of which is then raised to 60° Centigrade; the vessel is removed from the fire, and by means of an earthen tube drawn out at its lower extremity, which is plunged into the acid, one part of naphtha coal tar is added by degrees. Each addition of the essence which traverses the warm acid, immediately produces a brisk reaction, from which result an increase of temperature and disengagement with effervescence of carbonic acid and binoxide of nitrogen.

"If the liquid threatens to overflow, the oil must no longer be added, and it must be tempered down by the addition of a little cold acid. When the whole of the oil has been added, the greater part of it will have been already converted into picric acid; but there will still remain a considerable quantity in an intermediate state, in the form of a reddish resinous matter. To complete the transformation as much as possible, three new portions of nitric acid are added, the liquid boiled, and then evaporated to a syrupy consistence, care being taken not to allow the matter to dry; without this precaution, it would inflame and burn with intensity.

"Picric acid may also be obtained by operating without heat on a mixture of one part of oil of coal with two parts of nitric acid. By this means, heat is produced, and carbonic acid and oxide of nitrogen are disengaged; but the effervescence is not so violent as in the first case; a small quantity of nitrous vapour is produced, and thus a glutinous resinous matter is obtained, which is to be treated by nitric acid with the application of heat, and evaporated as before.

The syrupy liquid obtained in these two cases, becomes, on cooling, a yellowish

pasty mass, the weight of which is about one-sixth of the matter employed. It is composed of picric acid, a small quantity of resinous matter, and nitric acid. The picric acid is separated by boiling the mass in water, which dissolves it; it is then allowed to cool, when it becomes crystallized. Two or three crystallizations are sufficient to yield it almost pure; but to render it chemically so, it must be combined with a base, for instance, ammonia, and precipitated with an acid (nitric or hydrochloric acid) and then crystallized. After these operations, the picric acid is in the form of transparent crystals of a light lemon colour.

For the purposes of dyeing, it is useless to carry the operation thus far, as absolute purity is not necessary. We may confine ourselves to the following process: when the pasty mass before mentioned is obtained, it is to be washed in cold water to remove the excess of nitric acid, the residue then dissolved in boiling water, to which is added sulphuric acid (about 100 grammes to a hectolitre of water), so as to separate the resinous matter which accompanies picric acid. The presence of this matter would give a disagreeable odour to the silk, and destroy the colour, leaving a reddish disagreeable tint. By the process just described, a sufficiently pure solution of picric acid is obtained, which, diluted with water in proportion to the shade desired, may be immediately used for the purpose of dyeing. It is not necessary to make use of any intermediate agent to favour the combination of the colouring matter with the silk. In order that the combination should take place evenly, the process should be conducted at a temperature of from 30 to 40° C., the silk dyed by the picric acid, when taken out of the dye should be dried without any further operation or washing.

The following is the manner in which my attention was called to this new colouring agent in an industrial point of view. I received on the 20th of October 1850, the following letter from a M. Lemoine, of Paris:—

"SIR,—In your treatise on the dyeing of silk, wool, and cotton, you state that M Guinon, of Lyons, makes use of picric acid in a crystalline form to obtain a light yellow colour in silks. I wished to ascertain the fact, and I procured, through a friend, a specimen of these crystals and the price. M. Guinon informed one of his Paris correspondents that he did not manufacture crystals, and that in producing a light yellow in silks he employed a colouring liquid obtained from coal tar, which product he sold at twenty francs per litre; he further stated that he could not undertake to supply picric acid in a crystalline form on account of the difficulty of its manufacture.

"We have discovered a means of supplying commerce with a large quantity of this article, and at such a price as will permit of its use.

"I have the honour of forwarding to you a specimen of our crystals, and for the interests of science and commerce I beg of you to sacrifice a short time in the examination of this product. Your opinion would be of the greatest value to us before making our discovery an object of commerce.

"The liquid of M. Guinon contains fatty and oily matters, which increases the expense of its use, as much preparation and hand-work is required. A dyer in Paris, who is in the habit of using Guinon's liquid, has made a trial of our crystals, and appears satisfied with the results both as regards the colour and the simplicity of its application.

"I have the honour, &c.,

"22, Rue de Varrenne.

"LEMOINE."

According to the desire expressed in this letter, I employed the picric acid in the dyeing of silk, wool, and cotton. The following are the results I obtained:—

1. Silk when immersed in an aqueous solution of this acid, maintained at a temperature of from 30° to 40° Centigrade, rapidly assumed a fine shade of straw-yellow colour. I required 6.84 grammes of crystallized acid to dye one kilogramme of silk of this shade. But this silk thus dyed, without the aid of any mordant, discharged much of its colour in the water employed in the form of a wash.

By preparing the silk in the first place with a mixture of alum and cream of tartar, the picric acid is more permanently fixed, and the dyed silk may then be submitted to several washings without undergoing any alteration. But in all cases the colour will not resist the action of weak acids, weak alkalies, or weak chloride of lime. It is not much affected by exposure to the sun and air.

2. Wool is acted upon in the same manner as silk, with the exception of its taking a deeper shade, and becoming of a beautiful lemon yellow. Only 3.75 grammes of picric acid are necessary to give this shade to one kilogramme of wool. The washings do not affect the colour if the wool has been previously prepared with the

mordant of alum and cream of tartar. The shade is not injured by the sun or the air, but does not resist the action of chemical agents.

3. Cotton either prepared or not with the mordant, does not become coloured in the least in the solution of picric acid.

From the results of the numerous experiments I have made it appears—

1. That picric acid is a rich colouring matter for silks and wool.

2. That a fine yellow colour may be imparted to these tissues without injury to their texture, and with much simplicity of operation.

3. That in order to prevent the action of the washings, the tissues to be dyed should be previously prepared with a mordant of alum and cream of tartar.

4. That the shades produced by picric acid resist the action of the sun and air, but are affected by chemical agents, acids, alkalies, and decolourizing hypochlorites.

5. Therefore that picric acid is not a colouring matter of much permanence.

6. Nevertheless it is a substance which may be of much use in the dyeing of silk and wool, especially if its price be moderate.

7. That in any case it cannot be used in the dyeing of cotton and other vegetable textures.

I may add, in conclusion, that M. Lemoine supplies crystallized picric acid at twenty-five francs the kilogramme. At this price the dyeing of a kilogramme of silk would cost one franc seventy-two centimes, and that of a kilogramme of wool ninety-three centimes.—*Journal de Pharmacie.*

ON GUTTA TABAN.

BY BERTHOLD SEEMANN.

THE Taban (*Isonandra Gutta*, Hook.), which was formerly so plentiful [in Singapore], has long since been extinct. A few isolated trees may here and there occur, but they are very scarce, and I have not been able to obtain even the sight of one. Several of the white residents keep in their gardens, as a curiosity, a plant or two, but they grow very slowly. It must ever be an object of regret, that on the first introduction of the Taban gum, its proper name was not promulgated. Now everybody in Europe and America speaks of Gutta Percha, when, in fact, all the time they mean the Gutta Taban. The substance termed by the Malays "Gutta Percha" is not the produce of the *Isonandra Gutta*, Hook., but that of a botanically unknown tree, a species of *Ficus*, I am told. The confusion of these two names has become a popular error—an error which science will have to rectify.

The exportation of the indigenous Gutta Taban from Singapore commenced in 1844, but as early as the end of 1847, all, or at least most, of the trees had been exterminated. That at present shipped from the place, is brought in coasting vessels from the different ports of Borneo, Sumatra, the Malayan peninsula, and Jahore Archipelago*. The difference existing in its appearance and property is owing to the intermixture of Gutta Percha, Jelotong, Gegrek, Litchu, and other inferior Guttas, made by the natives in order to increase the weight. Though far from being extinct in the Indian Archipelago, Gutta Taban will every year be more difficult to obtain, as the coast region is said to be pretty well cleared, and a long transport from the interior must, by augmenting the labour, increase the value of the article.

A few months after the publication of your first account of the plant, in January, 1847, an article on the same subject appeared in the *Journal of the Indian Archipelago*, by one of its most able contributors, Dr. T. Oxley. As that article contains many

* "The total export of Gutta Taban from Singapore has been :—

In 1844.....	1 picul
In 1845.....	169 "
In 1846.....	5,364 "
In 1847.....	9,296 "
In 1848 to the 1st of July.....	6,768 "

Total 21,598 piculs

valued at 274,190 Spanish dollars. About 270,000 trees have probably been felled during the three and a half years that the trade has existed, and the value of each tree has thus on an average, been about a dollar.—J. R. Logan, "*On the Range of the Gutta Taban Collectors, and present Amount of Import into Singapore.*" Mr. Logan has promised an article on the various substances intermixed with the Taban, a subject of the highest interest; but he has hitherto disappointed his readers.

statements not contained in yours, and as it may possibly have escaped your notice, I shall make a few extracts from it.

"The Gutta-Taban tree belongs to the natural order *Sapotacea*, but differs so much from all described genera, that I am inclined to consider it a new one. I shall, therefore, endeavour to give its general character, leaving the honour of naming it to a more competent botanist, especially as, from want of complete specimens, I have not quite satisfied myself regarding the stamens and fruit.

"The tree is from sixty to seventy feet high, from two to three feet in diameter. In its general aspect it resembles the Durian (*Durio Zibethinus*, Linn.), so much so as to strike the most superficial observer. The leaves are alternate, obovate-lanceolate, entire, coriaceous, their upper surface is of a pale green, and their under surface covered with a close, short, reddish-brown hair. The flowers are axillary, from one to three in the axils, supported on short curved pedicels, and numerous along the extremities of the branches. The calyx is inferior, persistent, coriaceous, divided into six sepals, which are arranged in double series. The corolla is monopetalous, hypogynous, and divided, like the calyx, into six acuminate segments. The stamens, inserted into the throat of the corolla, are in a single series, and variable in number, but to the best of my observation, their normal number is twelve; they are most generally all fertile. The anthers are supported on slender bent filaments, and open by two lateral pores. The ovary is superior, terminated by a long single style, and six-celled; the cells are monospermous. The fruit is unknown to me.

"Only a short time ago the Taban-tree was tolerably abundant on the island of Singapore, but already (middle of 1847) all the large timber has been felled. Its geographical range, however, appears to be considerable, it being found all up the Malayan peninsula, as far as Penang, where I have ascertained it to be plentiful. Its favourite localities are the alluvial tracts on the foot of hills, where it forms the principal portion of the jungle.

"The quantity of solid gutta obtained from each tree, varies from five to twenty catties, so that, taking the average of ten catties, which is a tolerably liberal one, it will require the destruction of ten trees to produce one picul. Now, the quantity exported from Singapore to Europe, from the first of January, 1845, to the middle of 1847, amounted to 6918 piculs, to obtain which, 69,180 trees must have been sacrificed! How much better would it be to adopt the method of tapping the tree practised by the Burmese in obtaining the caoutchouc, than to continue the present process of extermination*."

A mercantile house in Singapore lately received from Manilla a gum which was supposed by those who sent it to be Gutta Taban, but proved a different substance. It was accompanied by specimens of the tree producing it, and a note stating that the gum abounded in the Philippine Islands. As it will probably make its appearance in England, and perhaps become of some importance, I may add that those specimens presented to me by the merchant, belong to the genus *Ficus*; but whether to a new or an already described species, want of books prevented me from determining.—*Hooker's Journal of Botany*.

ON GAMBIR.

BY BERTHOLD SEEMANN.

Black pepper (*Piper nigrum*, Linn.) and Gambir (*Uncaria Gambir*, Roxb.) are grown in great quantities [in Singapore], and exclusively by the Chinese, for both these articles are so exceedingly cheap that Europeans have not deemed it worth their while to engage in the speculation. Pepper and Gambir plantations are always combined, because the refuse of the gambir-leaves serve as an excellent manure for the pepper; and moreover, what is of equal, if not of still greater importance, kills the Lalang (*Andropogon caricosus*, Linn.), a plant which, like the couch-grass (*Triticum repens*, Linn.), spreads with astonishing rapidity over the fields, growing so close together and so high, that within a short space of time valuable plantations are rendered useless, and many have to be given up from the utter impossibility of freeing the ground from this weed.

The process by which gambir is extracted and prepared is simple. The leaves are boiled in water until all their astrigent property is extracted. The decoction is then poured into another vessel, in which it becomes inspissated, and, when nearly dry, is

* T. Oxley, in the *Journal of the Indian Archipelago*, vol. i., p. 22—30.

cut in small square pieces, and thus brought into the market. Mc'Culloch states that sago is used in thickening it. This, however, at least in Singapore, is not the case; but, instead of sago, a piece of wood is dipped into the vessel, by which the desired effect is produced. It must, indeed, be an extraordinary substance, the mere dipping of which into the fluid can cause it to become a thickened mass. I was very eager to obtain a piece of this wood; unluckily, the Chinaman whose laboratory I visited, could not be persuaded to part with his, and a friend of mine, who was exerting himself to procure a sample, had not succeeded at the time of the Herald's departure: he promised, however, to send it to England, accompanied by the Malayan name, and specimens of the tree.—*Hooker's Journal of Botany.*

ON THE GALBANUM PLANT.

BY F. A. BUHSE.

THE author states, that in his travels in Persia he discovered the plant which yields galbanum. In June, 1848, he found it on the declivities of the Demawend. It is a ferula, from the stalks of which a liquid issues abundantly, by the odour and nature of which he immediately recognized galbanum, and his guides assured him, moreover, that galbanum is gathered from this plant. The author has not yet distinctly determined the plant. It appears to differ from *Ferula erubescens* (*Annales des Sciences*, iii., Sér. 1844, p. 316) only by the absence of commissural vitæ; but as neither Aucher-Eloy nor Kotschy, who have both collected the *Ferula erubescens*, make any mention of its yielding galbanum, the author is in doubt whether his plant be the same, or a variety of it. Don's genus *Galbanum* (Trib. Sibrinæ) and Lindley's *Opaidia* (Trib. Smyrnee) do not agree with the plant seen by Buhse, unless that both of these authors have made their descriptions from imperfect fruits, or that there exist other plants which yield galbanum. The plant which Buhse describes is called, in some parts of Persia, *Khasuch* (not *Kasneh*, which means *Cichor intybus*, nor *Gashnis*, which is *Coriand. sativum*), and appears to be confined to certain districts of Persia. In the whole large district of the Elburs-chain, from the south-east angle to the south-west angle of the Caspian Sea, it is only found in the neighbourhood of the Demawend; but here at an elevation of from 4000 to 8000 feet, and even on the declivity of the top of the Demawend. It exists neither on the mountains of Talysh, nor in the districts of Karadagh and Tabris. It is said to re-appear on the Mount Alwend, near Hamadan, and in the neighbourhood of the great salt-desert. Near Hamadan Aucher-Eloy has gathered his *Ferula erubescens*, and this supports the supposition that the author's plant is the same. In the salt-desert itself Buhse did not meet with it again. The inhabitants of the Demawend collect the gum-resin, which issues spontaneously from the lower part of the stalk; they do not make incisions in the plant; but it is not at this place that the galbanum is collected for commercial purposes. When fresh, the gum-resin is white like milk, liquid, and somewhat glutinous. In the air it soon becomes yellow, elastic, and finally solid. The odour is rather strong, unpleasant, and similar to that of our commercial galbanum.—*Central Blatt*, für 1852, No. xiii.

BRONZE FOR PLASTER FIGURES.

LINSEED-OIL is to be saponified by boiling it with caustic soda, and as much common salt added as may be necessary to separate the soap. The latter is then to be dissolved in rain-water, and a solution of four parts of sulphate of copper and one part of sulphate of iron added, until a precipitate is no longer produced. The soap is to be washed, and then serves for imitating antique green rust, when we apply it in combination with a varnish, composed of twenty-four ounces of litharge, and three pounds of linseed oil. Thirty ounces of this varnish, sixteen ounces of bronze soap, and ten ounces of white wax are to be melted together, and the mixture applied by means of a brush to the figure, heated to 88° C. The figure may, if necessary, be placed in a heated box till the paint is absorbed. The elevated parts are then to be rubbed with a bronzing powder.—*Pharm. Central Blatt*, 1852, No. xiv.

IMPROVEMENT IN THE QUICK PROCESS FOR MANUFACTURING VINEGAR.

BY ANTON WIMMER.

INSTEAD of wood shavings, Wimmer employs in the manufacture of vinegar, pieces of charcoal of the size of a walnut, and which have been deprived of their saline matter by diluted muriatic acid, and afterwards washed with water. The charcoal effects the oxidation of spirit of wine in a much shorter time than the wood, and is not so soon spoiled by the formation of mother of vinegar. With charcoal, the operation can be performed, even on a very small scale, and vinegar may thus be prepared in glass bottles.—*Pharm. Central Blatt*, 1852, No. xiv.

COFFEE LEAVES.

MR. Daniel Hanbury, in a note just received, May 26th, has drawn our attention to an advertisement which has recently appeared in one of the Ceylon newspapers, demanding tenders for the supply of dried coffee leaves in large quantity. It is thus alluded to in the *Overland Colombo Observer*, April 14, 1852 :—

“In the advertisement columns of the local journals, a mercantile firm here call for samples of dried coffee leaves, with tenders for the supply by the ton, it being stated that an economic use of these leaves had been discovered in England.”

As no economic use of coffee leaves appears to be generally known, various speculations are adroit as to the purpose to which it is now designed to apply them.

The advertisement referred to emanates from Dr. Gardner, who proposes to introduce coffee leaves as a substitute for tea and coffee. Samples of the leaves with caffeine extracted from them, were shewn in the Great Exhibition. The leaves in their natural state are not suited for the purpose, but Dr. Gardner has taken out a patent for preparing them.—Ed.

CHEMICAL SOCIETY.

April 19th, 1852.

PROFESSOR DAURENT, PRESIDENT, IN THE CHAIR.

RESEARCHES ON THE CONSTITUTION OF ORGANIC ACIDS.

BY M. CHARLES GERHARDT.

Communicated by Dr. Williamson.

THE experiments described in this communication were instituted with the view of establishing a general formula for organic acids, which should be to them what the formula for ammonia is to the organic alkalies. The author believes that water, the molecule of which he assumes to consist of one atom of oxygen and two atoms of hydrogen, may be taken as the type of organic acids, the two atoms of hydrogen being capable of being replaced by simple metals or by complex groups, such as methyl, ethyl, &c. Reference is made to the results obtained by Dr. Williamson and Mr. Chancel tending to prove that alcohol, ether, and their homologues, represent molecules of water in which the two atoms of hydrogen are partly or wholly replaced by complex groups, in accordance with which theory the compound formed by replacing one atom of hydrogen in alcohol by potassium may be considered as the potassium salt of a weak acid—ethylic acid, which gives rise to a chloride (hydrochloric ether or chloride of ethyl) when acted upon by perchloride of phosphorus. Reference is also made to the experiments of Cahours, proving that various organic acids, such as benzoic, nitro-benzoic, cuminic, anisic, and cinnamic acids, experience similar changes under the influence of the same reagent.

Starting from this point, the author concluded that, by imitating the well-known reaction of ethylate of potassium on chloride of ethyl, but substituting the corresponding compounds of one of the above-mentioned acids for those of ethyl, the anhydrous acids ought to be obtained—a result which was fully confirmed by experiment. With benzoate of soda and chloride of benzoyle the experiment succeeded perfectly well when conducted in the following way: The soda salt was well dried and mixed with an equivalent weight of the chloride, and the mixture heated to 130° Cent., when it formed a limpid liquid, which at a temperature a few degrees higher

underwent decomposition, the peculiar smell of the chloride of benzoyle disappearing, and chloride of sodium being deposited. The product, suspended in cold water, and washed with carbonate of soda, left a white substance without odour and perfectly colourless, which was found on analysis to be *anhydrous benzoic acid*.



This new product crystallizes in oblique prisms, which melt at 33° Cent. It is volatile without decomposition, insoluble in water, but soluble in alcohol and ether, and these solutions are perfectly neutral. Boiling water transforms it by degrees into common benzoic acid.

Experiments were made in the same direction with other acids, the detailed account of which the author defers for a future communication.

NOTE ON THE PREPARATION OF CARBONATE OF AMYL.

BY JOHN A. BRUCE.

CARBONATE of amyl was prepared some years ago by Mr. Medlock, by treating fusel oil with phosphene gas, and decomposing the chlorocarbonate thus formed by heating it with water. The author adopted for its preparation the process which originally furnished the corresponding compound of the ethyl series, and which consists in heating the oxalate with potassium. When potassium comes in contact with perfectly dry oxalate of amyl it is rapidly attacked, a brown mass is formed around the metallic globules, and a colourless inflammable gas is disengaged. On distilling the brown fluid, a mixture of carbonate of potash and charcoal is left, and a pale yellow liquid passes over, which consists of not less than four different substances, namely, carbonate of amyl, fusel oil, oxalate of amyl, and a dark viscous substance having a powerful odour. The portion distilling at 226° Cent., was proved by analysis to be carbonate of amyl. $\text{C}_{10}\text{H}_{21}\text{CO}_3$. Its sp. gravity at 60° F. was 0.9065.

NEW FORMATION OF SALICYLIC ACID.

BY DR. GERLAND.

Communicated by Dr. Hoffmann.

In a comparative investigation of the three isomeric acids, the benzoic acid of Zinin, the anthranilic acid of Fritsche, and the carbanilic acid of Chancel, the immediate object of which was to test the frequently asserted view that these acids might be identical, Dr. Gerland obtained evidence that benzoic and anthranilic acids not only differ in their chemical properties, but yield, under similar circumstances, very different, and sometimes very interesting products of decomposition. One of the most interesting of these changes occurs when anthranilic acid is treated with nitrous acid. If nitrous acid, prepared by the action of nitric acid on arsenious acid, be passed through a warm dilute solution of anthranilic acid as long as nitrogen is disengaged, the solution remains clear, and deposits, on evaporation, fine long needles of an acid free from nitrogen, and having the composition and properties of salicylic acid. With salts of sesquioxide of iron it yields the characteristic violet colour produced by salicylic acid under the same circumstances, and on dry distillation a considerable quantity of phenole is produced, a portion of the acid subliming unchanged.

A dilute aqueous solution of benzoic acid also undergoes a change when exposed to the action of nitrous acid, but not a trace of salicylic is, in this case, produced.

May 3rd.

ROBERT WARINGTON, ESQ., VICE-PRESIDENT, IN THE CHAIR.

ON THE PREPARATION OF ANHYDROUS ACETIC ACID.

BY M. CHARLES GERHARDT.

THE author states that he has succeeded in preparing anhydrous acetic acid in a state of perfect purity, and giving by analysis numbers exactly agreeing with those calculated from its formula. It is obtained by mixing perfectly dry, fused, acetate of potash with about half its weight of chloride of benzoyle, and applying a gentle heat, when a limpid liquid distils over, which, after being rectified, has a constant boiling point of 137° Cent., is heavier than water, with which it does not mix until after it has been agitated with it for some time. It dissolves at once in hot water, forming hydrated acetic acid.

CHEMICAL MEMORANDA.

BY ROBERT WARINGTON.

UNDER this head the author notices—

1st. A curious form of crystallization of iodide of potassium, in which the salt assumes the appearance of square prisms of considerable length and of varying diameter, being apparently formed by the superposition of cubes of different sizes. The measurements of some crystals of this kind are given.

2ndly. A method of detecting, qualitatively, small quantities of oxide of copper in solution, by the addition of ferrocyanide of potassium to the solution to be tested, to which excess of ammonia has been previously added. The ferrocyanide of copper is held in solution by the ammonia, and is afterwards deposited from the filtrate as the ammonia is allowed to evaporate.

3rdly. Some additional facts relating to the green teas of commerce. In a former communication the author had stated that much of the green tea of commerce was coloured with Prussian blue, turmeric, and gypsum. He has since found that indigo is sometimes substituted for Prussian blue.

ON THE ACTION OF AMMONIA UPON BINOXYSULPHO-CARBONATE OF AMYL.

BY MATTHEW W. JOHNSON.

THE object of this investigation was to obtain and examine the compound in the amyl series homologous with the xanthamide obtained by M. Debus by the action of ammonia on binoxysulpho-carbonate of ethyl.

The process adopted consisted in adding a concentrated aqueous solution of ammonia to binoxysulpho-carbonate of amyl and digesting them together at a slightly elevated temperature. The mixture becomes turbid, sulphur is deposited, and a yellow liquid, through which oily particles are seen suspended, floats above. When one part by bulk of binoxysulpho-carbonate of amyl is treated with three parts of ammonia, a semi-solid mass results, which on being diluted with water and washed on a previously moistened filter, is separated into solution of amyloxanthate of ammonia which passes through, and a mixture of xanthamylamide and sulphur which are retained on the filter. On putting these latter on a dry filter, the xanthamylamide passes through, freed from the sulphur.

The analysis of this oily product, the products of its decomposition, and the examination of the compound which it forms with chloride of mercury, establish the existence, in the amyl series, of a substance homologous with the xanthamide of the ethyl series.

Direct experiment also proved that the body formed simultaneously with the xanthamylamide was amyloxanthate of ammonia.

ON A NEW PROCESS FOR THE DETECTION OF FLUORINE WHEN ACCOMPANIED BY SILICA.

BY GEORGE WILSON, M.D., F.R.S.E.

THIS process is founded upon the very familiar fact, that when a fluoride, combined or mixed with silica, is heated with oil of vitriol, the fluorine and silicon are evolved in combination, as the well-known fluoride of silicon; and it is applicable to all silicated fluorides which yield this gas. It is also applicable to compounds containing mere traces of fluorides but free from silica, which are brought within the compass of the process by the deliberate addition of silica to them, so as to admit of their being heated in large quantity with oil of vitriol in glass vessels. In either case, the fluoride of silicon set free is conveyed by a bent tube from a flask or retort into water. The resulting solution, containing some gelatinous silica, is super-saturated with ammonia and evaporated to dryness, during which process the fluoride of silicon and ammonia is resolved into silica which is rendered insoluble, and fluoride of ammonia, which is dissolved by digesting water on the evaporated residue. The solution is then evaporated to dryness and heated with oil of vitriol in a platinum crucible, covered by a piece of waxed glass.

THE OMISSION OF TOXICOLOGY FROM THE PHARMACY BILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

SIR,—By a note to a letter of mine in the *Lancet* of this week, on the Pharmacy Bill, I find that the word Toxicology has been expunged from the Bill.

I presume the alteration has been made in reference to the objections of some medical practitioners, who feared that a knowledge of toxicology would give an opening to Chemists and Druggists to practise as medical men. Such was the objection made to it by Dr. Webster, who is the accredited mouthpiece of a numerous body of that class, to which, as a practitioner, he belongs.

It was to combat such objections that I wrote to the *Lancet*, and I regret that they have declined to publish what I sent on that part of the subject. I have no copy of what I wrote, but the substance was this :—

An acquaintance with Toxicology cannot lead a Chemist and Druggist into practice further than to administer an antidote, on an emergency, in case of poisoning—accidents of daily occurrence. The medical practitioner, when called upon on such occasions, may be away far from home, going his rounds, no one knowing where to find him; but the Chemist and Druggist is always on the spot, having to do his business at home, where he is constantly accessible to the public, with all the materials and appliances at hand necessary on such emergencies, so that he (the Chemist and Druggist) is clearly a very, if not the most eligible person to be made the depository of toxicological knowledge to meet such sudden exigencies.

Now, Sir, I hope that you will view this matter as I do, and that, as a faithful servant to the public, you will endeavour to include *Toxicology* in the curriculum of the education of the future Chemist and Druggist, and it is in the hope of inducing you to reconsider the subject, that I intrude this upon you.

I have the honour to be, Sir, your very obedient Servant,

GARRETT DILLON.

5, Spanish Place, Manchester Square,
18th May, 1852.

NOTICES OF BOOKS RECEIVED.

CLASS BOOK OF BOTANY, *being an Introduction to the Study of the Vegetable Kingdom.* By J. H. BALFOUR, M.D., F.R.S.E., &c., Professor of Medicine and Botany in the University of Edinburgh, &c. Edinburgh: A. & C. Black. London: Longman & Co. 1852. Part I., Structural and Morphological Botany, with upwards of 1000 Illustrations.

It is now nearly three years since we noticed in this Journal Professor Balfour's *Manual of Botany*. We were then able to speak most satisfactorily of its merits, and to recommend it strongly to Pharmaceutical and other students desirous of becoming acquainted with the science of botany. We are glad to find that its success was so decided that another edition was soon called for, and Professor Balfour, taking advantage of the opportunity thus afforded him, has enlarged upon his original work, and lately issued the first Part of a new one, which he now calls the *Class Book of Botany*, as it is especially designed for the use of students attending lectures, &c. This part includes structural and morphological botany, and so far the work is entirely re-written, and is also more fully illustrated than the former Manual. Our space will not allow of any extracts being made from it, but it is written in the clear and easy style which caused the former work to be so popular. It may be considered a faithful abstract of what is at present known of structural and morphological botany, and as such we candidly recommend it to the Pharmaceutical, medical, and other students who wish to obtain an accurate knowledge of the science of which it treats. We hope the interval will not be long between the appearance of the first and second parts.

THE POPULAR NOMENCLATURE OF THE AMERICAN FLORA. By BERTHOLD SEEMANN. Hanover : 1851.

This is but a fragment, and a prelude to a more extended collection of popular names of plants of all countries. It is likely to be of use to the Pharmacologist, and is a work requiring a great amount of tedious research.

A MANUAL OF PATHOLOGICAL ANATOMY. By CARL ROKITANSKY, M.D., Curator of the Imperial Pathological Museum and Professor at the University of Vienna, &c. In four volumes. Vol. IV. London : Printed for the Sydenham Society, 1852.

TO CORRESPONDENTS.

C. F. D.—(1.) Pereira's *Materia Medica*.—(2.) We are not acquainted with any Latin class expressly for Pharmaceutical Students. Probably *Selecta & Prescriptia*, or the *Pharmaceutical Latin Grammar*, would be useful.

W. K. (Spalding).—Royle's or Pereira's *Materia Medica*, Fownes' *Manual of Chemistry*, and Balfour's *Manual of Botany*.

Chemicus.—(1.) French polish answers for sticking labels on tin.—(2.) When lbj. of a liquid is prescribed, we believe sixteen fluid ounces are generally intended, although according to the Pharmacopœia twelve ounces would be correct.—(3.) Blue paper or glass is often used for the protection of nitrate of silver, &c., from the action of light; but the colour which ought to be used is red.—(4.) Tinct. Lactucarii: $\mathcal{R}$ Powdered lactucarium $\mathfrak{z}\text{iv}$.; proof spirit Oij. Digest or percolate. (P. E.)

Medicus.—Phosphorus paste. (See vol. v., page 134.)

Enquirer.—(1.) Silver is soluble in nitric acid: the solution gives, on the addition of chloride of sodium, a white precipitate soluble in excess of ammonia.—(2.) *Accum's Chemical Re-agents*, by Maugham.

An Associate (Wolverhampton).—Solution of caustic potash should be made according to the Pharmacopœia. It would be free from any carbonate if the air be excluded.

D. W. (Taunton).—(1.) Liquor Taraxaci: $\mathcal{R}$ Expressed juice of taraxacum three parts; rectified spirit one part; mix, and allow it to stand for twenty-four hours; then decant and filter.—(2.) Soluble copaiba. (See vol. x., page 212.)

A. R. A.—Ammonia removes the stain of bichromate of potash.

A. X. Z.—Most wholesale Druggists export to Australia. If we mentioned the names of any in particular we should be liable to a tax for an advertisement.

A Constant Reader (Loughbro').—(1.) Blane's *Veterinary Art*.—(2.) Noad's *Chemical Manipulation and Analysis*.

"Wivelscombe, May 19, 1852.

"**SIR**.—Having been informed that this month's Pharmaceutical Journal contained a notice referring to myself. I have just been favoured with its loan by a friend, and find it to be the case.

"I cannot but think it due to myself to state, and feel confident you will not hesitate to give publicity to the assertion I make, viz.: that I did not send, or cause to be sent, the Toothache Advertisement to the *News of the World* Newspaper, nor was I aware that the paper in question contained such, until informed thereof by a medical gentleman of this town; when I at once denied all knowledge thereof. I have not received nor replied to any letters touching that advertisement. I am not a Chemist, nor have I in a single instance designated myself as such.

"I am, Sir, your obedient Servant,

"THOS. NEWTON, Jun."

M. X. T. states, "The consumers of ferri ammonio-citras have been much alarmed since the appearance of your last journal," &c. We do not know to what this refers. Solution of caustic potash does not cause an immediate precipitate in solution of ammonio-citrate of iron; but on the application of heat oxide of iron is thrown down.

Chemicus.—The tables referred to would not give the required information. The subject of chemical equivalents is more fully treated of in Turner's *Chemistry*.—The liquids referred to at page 23 are such as are described at pages 47 and 48. When the pressure of steam is represented to be equal to a certain number of atmospheres the meaning is that the elastic force of the steam is equal to the pressure of so many atmospheres.—To the last question, Yes.

Iodine.—Iodide of potassium is very rarely free from a trace of carbonate.

Chamomelius.—(1.) A registered apprentice can become a member only by passing the required examinations.—(2.) Botany, *Materia Medica*, Chemistry, Pharmacy, Latin Prescriptions.

A Would-be Member (Brighton).—See vol. vii., No. 7.

Instructions from Members and Associates, respecting the transmission of the Journal, to Mr. SMITH, Secretary, 17, Bloomsbury Square, before the 20th of the month.

Advertisements (not later than the 23d of the month) to Mr. CHURCHILL, Princes Street, Soho. Other communications to the Editor.

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